Impact of Mandatory Changes in Convertible Debt Accounting: Evidence from APB 14-1

by

Na Li

A thesis submitted in conformity with the requirements
for the degree of Doctor of Philosophy
Department of Accounting
Rotman School of Management
University of Toronto

August 2, 2014

ABSTRACT

Impact of Mandatory Changes in Convertible Debt Accounting: Evidence from APB 14-1

Doctor of Philosophy, 2014

Na Li

Department of Accounting, Rotman School of Management

University of Toronto

Using a set of hand-collected data, I study the economic consequences of APB 14-1, adopted in 2008, which requires that issuers of cash-settled convertible debt divide the total proceeds from the issuances into liability and equity components ("bifurcation"). First, I find that issuers are more likely to reduce the outstanding amount of cash-settled convertible debt when the increase (decrease) in interest expense (leverage ratio) resulting from the bifurcation process is higher (lower). The probability of early repurchase is higher when mandatory accounting changes are included in the calculation of debt covenant compliance. This finding is consistent with the debt contracting hypothesis that APB 14-1 increases the probability of debt covenant violations. Next, I examine whether credit rating agencies evaluate the issuers' accounting information differently after the adoption of APB 14-1. I find that the financial ratios in the post-2008 period, such as interest coverage ratios and leverage ratios, can better explain the issuers' credit ratings than those in the pre-2008 period. Finally, I find that shareholders of cash-settled convertible bond issuers experience an overall loss of wealth of 2.1% associated with APB 14-1. The negative shareholder reactions are greater when issuers use rolling GAAP in their bank loan agreements to calculate debt covenant compliance than if they do not. These empirical results are consistent with the notion that mandatory changes in financial reporting of cash-settled convertible debt

have real effects on managerial behavior and the usefulness of information from financial statements used by the credit market.

TABLE OF CONTENTS

Page

1. Introduction

This study examines the impact of mandatory changes in accounting standards for cash-settled convertible debt. In particular, I study firms' and financial statement users' responses to FASB Staff Position No. APB 14-1, *Accounting for Convertible Debt Instruments That May Be Settled in Cash upon Conversion (Including Partial Cash Settlement)* (hereafter "APB 14-1"), which became effective in 2008.

APB 14-1 had a major impact on the financial statements of many issuers of convertible debt securities. Before the FASB issued APB 14-1 in 2008, convertible debt that may be settled in cash upon conversion (hereafter "cash-settled convertible debt") was classified as a liability and the interest expense was calculated using the proceeds from the issuance and the coupon rate.[1] The issuers of such convertible debt enjoyed both lower interest expense and more favorable earnings per share relative to other types of securities.[2] APB 14-1 changed the recognition and measurement methods and the disclosure of cash-settled convertible debt. It requires that issuers of cash-settled convertible debt divide the proceeds received upon issuance between the liability and equity components.[3] This division process is termed "bifurcation." The equity component represents a discount on the debt component and is amortized as interest expense over the expected life of the convertible debt. The fundamental principle of such a separation approach, as stated in APB 14-1, is to require an issuer of cash-settled convertible debt to "recognize the same interest cost it would have incurred had it issued a comparable debt instrument without the embedded conversion option." The bifurcation requirement under APB 14-1 affects both income statement (higher interest expense and lower accounting earnings) and

[1] FASB APB 14 – Accounting for Convertible Debt and Debt Issued with Stock Purchase Warrants, March 1969.
[2] Cash-settled convertible debt became popular after the FASB amended the Emerging Issues Task Force (EITF) 90-19 in 2002 which allows for the exclusion of such securities from the calculation of fully diluted earnings per share (EPS).
[3] Under the FASB Accounting Standard Codification (ASC), APB 14-1 corresponds to ASC 470-20.

balance sheet classification (lower debt and higher shareholders' equity). The simultaneous impact on both income statement and balance sheet provides a unique setting to examine the real effects of accounting standard changes.

The FASB issued APB 14-1 as the first step of its broader liabilities and equity project jointly with the IASB. The FASB provides two rationales for issuing APB 14-1. First, the recognition and measurement methods required by APB 14-1 are consistent with the FASB's intent to reduce the opportunities for firms "to structure instruments and arrangements to achieve a desired accounting outcome."[4] Such desired accounting outcomes could be lower interest expense, higher reported earnings, and higher EPS figures. Second, the disclosure requirements of APB 14-1 are "intended to provide users of financial statements with information" to better understand the terms of convertible debt.

These two rationales are based on FASB's concern that the previous accounting treatment of cash-settled convertible debt did not appropriately reflect the economic effects of these instruments.[5] However, whether the accounting changes in APB 14-1 would have any real economic impact would depend on whether the users of financial statements were able to make accounting adjustments for cash-settled convertible debt even before the adoption of APB 14-1. For example, if both the credit analysts and shareholders of firms that issued cash-settled convertible debt were able to make complete adjustments to the accounting information they used prior to 2008, then the expected impact of APB 14-1would be minimal.

[4] FASB Preliminary Views—Financial Instruments with Characteristics of Equity, November 2007.
[5] FASB amended EITF 90-19 in 2002 to provide accounting guidance for cash-settled convertible debt instruments. Under the amended EITF 90-19, cash-settled convertible debt is accounted for as liability in its entirety. However, FASB allows the exclusion of cash-settled convertible debt from the calculation of diluted EPS. As a result, cash-settled convertible debt "has less of a dilutive effect than a convertible debt instrument that requires application of the if-converted method." (APB 14-1a, 2007)

In this study, I use a set of hand-collected data to empirically examine three questions that are closely related to the effects of changes in the accounting treatment of cash-settled convertible debt. First, I study whether managers at firms that issued cash-settled convertible debt prior to 2008 responded to APB 14-1 by reducing their outstanding cash-settled convertible debt. Second, I examine whether, prior to APB 14-1, credit rating agencies were able to make complete adjustments to accounting ratios when they assigned credit ratings to account for the potential bifurcation of cash-settled convertible debt. Last, I study how shareholders reacted around the dates that led up to the final passage of APB 14-1.

My analyses are based on a sample of U.S. public firms that issued new convertible debt from 2005 to 2011. First, I predict that APB 14-1 increases the cost of using cash-settled convertible debt, which makes it less attractive to firms. Consistent with my prediction, I find that cash-settled convertible debt issuances in the U.S. grew dramatically starting in 2005, but experienced a sharp decline in 2008. Total proceeds received from cash-settled convertible debt issuances increased from $15.1 billion dollars in 2005 to $41.3 billion dollars in 2007, representing a growth rate of 174%. But new issuance of cash-settled convertible debt took a drastic downward turn in 2008 to $13.7 billion dollars, a decrease of almost 200% from 2007. A potential alternative explanation for such a drop is the 2008 financial crisis, which caused a credit crunch in the overall credit market. However, the total proceeds received from new issuance of straight debt experienced an increase of 60% from 2005 to 2007 and a decrease of only 26% from 2007 to 2008, significantly lower than the 200% decrease in cash-settled convertible debt issuance.

My next set of analyses documents that around the time of the adoption of APB 14-1, the issuers responded to the accounting standard changes by reducing their amount of outstanding

cash-settled convertible debt. During the period from 2005 to 2011, 143 unique cash-settled convertible debt issuers started to repurchase early, 60% of which did so in 2008 and 2009. Results from multivariate probit models show that within cash-settled convertible issuers, there is a positive (negative) relation between the likelihood of managers undertaking repurchase and the increase in interest expense (decrease in leverage ratio) resulting from the bifurcation. This positive (negative) relation is stronger when firms repurchased in 2008 compared to 2009. These results are robust to the consideration of a firm's financial constraint and investment efficiency during the 2008 financial crisis. Consistent with survey evidence from Graham, Harvey, and Rajgopal (2005), my results suggest that managers are willing to sacrifice their cash on hand for the sake of reporting a desired accounting outcome. In addition, the likelihood of repurchase increases when mandatory accounting changes are included in the calculation of debt covenant compliance. These results point to real effects and provide support for the debt contracting hypothesis (Watts and Zimmerman, 1986, 1990).

In a third set of analyses, I examine whether the adoption of APB 14-1 improves the relevance of accounting ratios for credit ratings, in particular the interest coverage and leverage ratios. The sample period is divided into two sub-periods: the period before the 2008 adoption of APB 14-1 (the pre-2008 period) and the period after the 2008 adoption of APB 14-1 (the post-2008 period). I then compare the coefficients on interest coverage and leverage ratios of a logit model that predicts issuers' credit ratings. I find that the both interest coverage and leverage ratios are more relevant to the credit ratings in the post-2008 period than in the pre-2008 period. In the pre-2008 period, I then calculate the "as-if" adjusted ratios that take into account the amortization of debt discount resulting from bifurcation.[6] I find that such adjusted interest

[6] A detailed discussion of the adjustment is presented in Appendix A. As explained there, the adjustment is a challenging task that requires knowledge of the appropriate discount rate in order to amortize the debt discount

coverage and leverage ratios do not seem to explain the credit ratings better than the unadjusted ratios. When comparing the post-2008 interest coverage and leverage ratios with the pre-2008 ratios adjusted for the impact of APB 14-1, I find that the coefficient on the post-2008 reported interest coverage ratio is statistically higher than the one on the pre-2008 adjusted ratio. These results suggest that the interest coverage ratio in the post-2008 period is more informative than both the adjusted and the unadjusted interest coverage ratios in the pre-2008 period. Overall, these results suggest that APB 14-1 improves the information content of the financial reporting of cash-settled convertible debt.[7]

My study adds to the existing literature in several ways. First, my study contributes to the literature that focuses on the real effect of accounting standard changes. Prior studies provide direct evidence that changes of accounting standards have an important impact on managerial decision-making (Imhoff and Thomas, 1988; Mittelstaed, Nicholes, and Regier, 1995; Bens, Nagar, Skinner, and Wong, 2003; Hodder et al., 2006; Marquardt and Wiedman, 2007; Bens and Monahan, 2008; Choudhary, Rajgopal, and Venkatachalam, 2008; Choudhary 2011). I provide evidence that managers are willing to change their capital investment plans to achieve a desired financial reporting outcome (Graham, Harvey, and Rajgopal, 2005; Marquardt and Wiedman, 2007). My study differs from these prior studies by jointly testing the impact of mandatory accounting changes on both income statements and balance sheets. My results provide evidence

---

under the interest method. The selection of a discount rate may be affected by many considerations. For example, the choice of a rate may be affected by the approximation of the prevailing market rates for comparable debt securities, and the current rates for debt securities with substantially identical terms and risks that are traded in open markets.

[7] APB 14-1 affects firms' credit ratings because it changes firms' default probability. Besides firms' credit ratings, it may also affect bond pricing and trading volume. Examination of the relation between APB 14-1 and bond market reaction is beyond the scope of this study and will be included in future work. This study focuses on credit ratings because credit rating agencies are important information intermediaries in the bond market. Credit analysts at these rating agencies are considered to be able to thoroughly understand the underlying economics of hybrid securities. If they were able to completely make adjustments to issuers' accounting ratios before the adoption of APB 14-1, then I should not observe significant results in any of the three tests in my study. For a detailed discussion about the importance of credit ratings, please see Section 2.5.

that firms strategically respond to the accounting standard changes under APB 14-1 by weighing the advantage of a lower leverage ratio against the disadvantage of a lower net income number.

Prior studies focus on the effects on equity price when they examine the changes in the value-relevance of accounting amounts reported before and after the changes in accounting standards. Some studies compare the coefficients on the adjusted accounting numbers being studied with those on the numbers without the adjustments from the changes in standards (e.g., Barth, Beaver, and Landsman, 1996; Aboody, Barth, and Kasznik, 1999). Rejecting the null that the coefficients are the same suggests that the adjusted accounting numbers being studied provide relevance and reliability that are incremental to the unadjusted ones (Barth, Beaver, and Landsman, 2001). A few studies examine the effects of changes in accounting standards on the credit market (e.g., Beatty, Ramesh, and Weber 2002). My study contributes to the literature that examines the value-relevance of accounting numbers by showing that changes in the financial reporting of cash-settled convertible debt affect how credit rating agencies evaluate firms' credit risk.

Finally, my results are relevant to the FASB and IASB's ongoing joint project on financial instruments with characteristics of equity. In its 2007 "Preliminary Views," the FASB states that it prefers an approach to classify equity and liability that "provides more decision-useful information to investors" and reduces the opportunities for firms to "structure instruments or transactions to achieve desired accounting outcomes." I show that in response to the adoption of APB 14-1, firms weigh the favorable outcome of a lower leverage ratio against the unfavorable outcome of higher interest expense when making the decision to keep or reduce their outstanding cash-settled convertible debt. Bifurcation of cash-settled convertible debt provides more decision-relevant information to credit investors. These results provide the FASB with

empirical evidence that is relevant to its joint project with the IASB on the classification and measurement of financial instruments.

The rest of this study is organized as follows. In the next section, I discuss the background and related research. I develop the hypotheses in Section 3. Section 4 describes the sample data and the research design. Section 5 discusses the results. Section 6 reports robustness tests and sensitivity analyses. Section 7 concludes.

2. Background and Related Literature

2.1 FASB Staff Position APB 14-1

Cash-settled convertible debt became popular after the FASB amended EITF 90-19 in 2002 to exclude such securities from the calculation of fully diluted EPS. The issuers of cash-settled convertible debt have since enjoyed lower interest expense and higher EPS figures than they have with other debt securities. The popularity of cash-settled convertible debt drew the attention of the FASB and prompted it to start discussing the elimination of the favorable accounting treatment of these debt securities. The EITF first started to discuss the issue of how to appropriately account for cash-settled convertibles at its meetings on March 15, 2007 and June 14, 2007. However, no conclusion was reached at these meetings. Later in 2007, the FASB issued the Proposed Staff Position No. APB 14-a and invited comments from individuals and organizations. In this proposed draft, the FASB discusses the background and the basis for the accounting changes. The FASB expects that such mandatory changes in the accounting treatment of cash-settled convertible debt will help investors and other users of financial statements to better understand firms' financial positions. However, many issuers, creditors and analysts did not seem to appreciate these benefits of APB 14-1 as proposed by the FASB. During the public

comment period, about 80% of the comment letters received from various parties did not support the proposed changes in APB 14-1. The critics expressed concerns that such adjustments would reduce the usefulness of financial reporting and not reflect the actual amount, timing and uncertainty of cash flows.[8] The proposed bifurcation method for cash-settled convertible bonds also generated considerable coverage in the business press. This new accounting standard for cash-settled convertible bonds was described as "a splitting headache". [9] In the same article, an ex-managing partner at Lehman Brothers made a prediction that due to the significant impact of APB 14-1 on firms' bottom lines, "cash-settled convertibles will not be issued anymore."

Nonetheless, on May 9, 2008, the FASB released the final version of APB 14-1, which requires that issuers of convertible debt instruments that may be settled in cash upon conversion divide proceeds received on issuance between the liability and equity components. In order to implement bifurcation, the carrying amount of the liability component is calculated as the fair value of a similar liability (including any embedded features other than the conversion option) that does not have an associated equity component. The carrying amount of the equity component represented by the embedded conversion option is the difference between the total proceeds received for the convertible debt instrument as a whole and the fair value of the liability component. This allocation results in a discount on the debt component equal to the difference between the total proceeds received and the value of the debt component. This discount is then amortized as interest expense over the expected life of the convertible. A detailed example is presented in Appendix B.

[8] Some argued that such accounting changes will harm creditors and investors because restrictive covenants in bank loan or straight debt agreements do not always provide automatic revisions due to the future changes in the GAAP (Letter of Comment to Proposed FSP APB14-a by The Stanley Works, 2007). In order to avoid triggering technical defaults, lenders will require borrowers to "amend the existing loan agreements to calculate covenants based upon adjusted GAAP rather than GAAP" to reflect the adjustments to interest expense coverage and leverage ratios (Letter of Comment to Proposed FSP APB14-a by Developer Diversified Realty, 2007).

[9] Edward Teach, "A Splitting Headache?" *CFO.com*, September 14, 2007, accessed May 7, 2014, http://ww2.cfo.com/accounting-tax/2007/09/a-splitting-headache/

APB 14-1 is effective for fiscal years and quarters beginning after December 15, 2008. Prior to the APB 14-1, the U.S. GAAP required that all convertible debt securities be reported as liabilities. No bifurcation was required.[10] However, with the increasing complexity of financial instruments, the FASB believed that it was necessary to provide specific guidance on certain financial instruments. In its "Preliminary Views" issued in 2007, the FASB claims that its preferred approach to classifying and measuring convertible instruments is the one that can best reduce the opportunities to "structure instruments and arrangements to achieve a desired accounting outcome."[11]

2.2 Institutional Background of Convertible Debt Financing

The convertible bond market, similar to the general bond market, is most exclusively covered by institutional investors. These institutional investors are considered to be more sophisticated than individual investors. They have access to both public information (e.g., financial statements publicly available) and private information (e.g., private research) about the firms they invest in. Issuers of convertible bond can choose to make the new issuance either public by registering the convertible securities with the SEC and trading them on the listed exchanges, or private under the Securities Act Rule 144A. The SEC requires that both public and private issuances of convertible bonds be disclosed in issuers' annual or quarterly reports on Forms 10K or 10Q, respectively, and any interim reports on Form 8K.

Conversion terms, such as conversion price, maturity date, call protection period, and method of payment at settlement, are determined by the issuers prior to the sale of the convertible bonds. Historically, holders of convertible bonds would receive shares of common

[10] However, issuers of convertible debt instruments have been required to bifurcate the instruments into liability and equity components since 1996 under both IFRS and Canadian GAAP. Please refer to IAS 32 and CICA Handbook Sections 3855, 3862 and 3863. IFRS took effects in Canada on January 1, 2011.
[11] FASB Preliminary Views—Financial Instruments with Characteristics of Equity, November 2007.

stock at the conversion or maturity of the bonds. Since the early 1990s, there have been many innovations in the method of payment upon conversion or maturity.[12] The inclusion of the cash settlement feature in the convertible bond contract started immediately after the FASB amended its EITF 90-19 in 2002, which allows the exclusion of such convertible bonds from the calculation of diluted EPS.

Issuers of convertible bonds can now choose to settle the conversion by paying cash instead of common stock.[13] Issuers choose the method of settlement in the financing agreements before the sale of the convertible bond. Thus, a subsequent change of method of settlement will require a renegotiation of contracts between the issuer and the investors and can be costly to the issuers.

2.3 Research on Convertible Debt

Theories in the corporate finance literature about why firms issue convertible debt generally focus on how to mitigate information asymmetry and agency problems to lower the costs of raising external capital and to increase the investment efficiency.

The prior finance literature provides four non-mutually exclusive rationales for convertible debt issuance. First, the risk-shifting theory (Jensen and Meckling 1976; Green 1984) argues that convertibles can mitigate shareholders' asset substitution incentives, since profits from risk-increasing strategies will have to be shared with convertible bondholders.

Second, the risk uncertainty rationale of Brennan and Schwartz (1988) argues that the cost of convertible bonds is the weighted average of the straight debt component and the equity

[12] Lewis and Verwijmeren (2011) provide a more detailed discussion of the innovations in convertible security designs.

[13] Issuers have the following choices if they select a cash settlement feature in their convertible bond design. First, issuers can pay the full conversion value in cash. Second, issuers can pay the sum of the principal and accrued interest in cash, and the conversion spread in either cash or common stock. Third, issuers can choose any combination of cash and common stock at conversion or maturity. The second choice is the most popular among the sample firms in this study. All issuers of cash-settled convertible bonds in my sample selected the second method.

option embedded in the convertibles. The hybrid nature of convertible bonds makes them less sensitive to the risk of issuing firms. This is because the increase in risk negatively affects the value of the straight debt component, but positively affects the value of the equity component. Thus, convertible bonds are useful financing tools when insiders and outsiders hold different opinions about firm risk, since changes in firm risk will have opposite effects on the values of convertibles' debt and equity components.

Third, the sequential financing theory of Mayers (1998) is based on the assumption that investors are uncertain about the value of future investment opportunities. In this setting, convertible debt is more suitable than straight debt for financing a sequence of investment options and reducing the overinvestment problem. It can also reduce the overinvestment problem through redemption and returning the funds to the bondholders.

Finally, the backdoor equity theory of Stein (1992) models convertible bonds as a form of delayed equity financing for firms that combine high equity-related adverse selection costs with high financial distress costs. The call option of convertible bonds allows the issuers to force early conversion of debt into equity, which helps the issuers to get equity into their capital structure and reduce the financial stress resulting from excessive debt.

These theoretical predictions are supported by empirical studies. For example, prior studies have shown that firms issue convertible debt when they are smaller, higher in growth, more financially constrained, and less profitable (e.g., Graham and Harvey, 2001; Gomes and Phillips, 2004). This is consistent with Green (1984) and Brennan and Schwartz (1988). In addition, Graham and Harvey (2001) survey 392 CFOs and document factors that affect firms' decision to issue convertible debt. Over half of the firms surveyed believe that convertible debt is a relatively inexpensive way to issue "delayed" equity when their stocks are undervalued. Firms

also consider it important that convertible debt is less expensive than straight debt. This provides supporting evidence for Stein (1992) and Mayers (1998).

Tufano (2003) reviews the literature on financial innovations and suggests that innovations persist in the financial market because the capital market is incomplete and because agency problems and information asymmetries exist between the issuers and the investors (e.g., Haugen and Senbett, 1981; Black, 1986; Ross, 1989; Beatty, Berger and Magliolo, 1995; Grinblatt and Longstaff, 2000). In addition, transaction costs in the market and tax and other regulations also drive the innovations in the financial market (Miller, 1986; McConnell and Schwartz, 1992).

Empirical studies of innovation in convertible bond design find that issuers select particular methods of payment at settlement in order to achieve certain financial reporting goals (Marquardt and Wiedman, 2005; Lewis and Verwijmeren, 2011). For example, Marquardt and Wiedman (2005) find that some firms added contingent conditions of conversion to convertible bond contracts in order to report higher diluted EPS. The use of the cash settlement feature increased substantially after 2002, when the FASB revised its accounting guidance to allow for a favorable treatment of cash-settled convertibles in diluted EPS calculations. Prior research has documented that issuers of cash-settled convertible bonds, as compared to equity-settled convertible bonds, are firms that are less financially constrained, less profitable, and more cash rich (Graham and Harvey, 2005; Lewis and Verwijmeren, 2011).

2.4 Real Effect of Accounting Standard Changes

The extant literature regarding the consequences of changes in accounting standards generally falls into two categories: changes in the value-relevance of accounting numbers and changes in firms' economic behavior. However, prior studies provide mixed results about the

effects of mandatory accounting changes (Barth, Beaver, and Landsman, 2001; Holthausen and Watts, 2001). For example, accounting standard changes have been shown to be related to changes in firms' decisions about R&D spending (Horowitz and Kolodny, 1981), post-retirement benefits (Mittelstaed, Nichols, and Regier, 1995), and financing choices (Imhoff and Thomas, 1988; Levi and Segal, 2011). In addition, changes in accounting standards, such as fair value accounting under SFAS No. 107, are related to changes in equity market value (Barth, 1994; Barth, Beaver, and Landsman, 1996). In contrast, other studies do not find reliable evidence that changes in accounting standards are associated with changes in equity prices (Dukes, Dyckman and Elloit, 1980; Nelson, 1996) or the costs of debt and equity (Bratten, Choudhary, and Schipper, 2013). While the impact of changes in accounting standards is still under debate, the recent adoption of APB 14-1 provides a unique and interesting setting to further explore this issue.

Many prior studies have documented that changes in accounting standards affect managerial behavior. For example, in response to accounting standards changes, managers would structure securities to report higher diluted EPS and lower debt-to-equity ratios (Imhoff and Thomas, 1988; Levi and Segal, 2005; Marquardt and Wiedman, 2005, 2007; Scott, Wiedman, and Wier, 2011), to reduce R&D spending to avoid expensing (Horowitz and Kolodny, 1981; Elliot, Richardson, Dykman, and Dukes, 1984), to understate employee stock option value estimates (Aboody, Barth, and Kasznik, 2004), and to reduce post-retirement benefits to decrease debt-to-equity ratios (Mittelstaedt, Nichols, and Regier, 1995). However, other studies of changes in accounting standards fail to find supporting evidence for managerial behavior changes (e.g., Dukes, Dyckman, and Elliot, 1980).

Extant literature on value relevance of mandatory accounting changes often use equity market value as the valuation benchmark to assess how well particular accounting figures reflect information used by investors (Barth, Beaver, and Landsman, 2001; Holthausen and Watts, 2001). The tests of these value relevance studies generally focus on the coefficients on the accounting amounts under a proposed standard. Mandatory accounting changes are considered value-relevant if these coefficients are significantly different from zero with the predicted signs, or from the theoretical estimations, or from the coefficients on the accounting numbers under the existing GAAP (Barth, Beaver, and Landsman, 2001). Empirical results from value-relevance studies are mixed. For example, fair values of banks' debt and equity securities under SFAS No. 107 have been shown to be more relevant to equity prices than book values (e.g., Barth, 1994; Bernard, Merton, and Palepu, 1995; Barth, Beaver, and Landsman, 1996; Barth and Clinch, 1998). Expensing employee stock options under SFAS 123 provides reliable information regarding the estimation of firm value (Aboody, Barth, and Kasznik, 2004). However, studies of "other comprehensive income" under SFAS No. 130 do not find consistent evidence that "other comprehensive income" is more strongly associated with returns than net income (Dhaliwal, Subramanyam, and Trezevant, 1999; Bartov, 1997). In contrast to the extensive research in the relevance of accounting standards to equity values, studies of the association between credit pricing and accounting standards are limited. Demerjian (2011) finds that changes in objectives of standard setting influence the use of balance sheet covenants in debt contracts. Beatty, Ramesh, and Weber (2002) find that exclusions of mandatory and voluntary accounting changes from the calculation of covenant compliance are related to lower interest rates charged on firms' loans.

2.5 Credit Rating Agencies and Convertible Debt

2.5.1 Use of Issuers' Credit Ratings

Credit ratings are defined as "forward-looking opinions about an obligor's overall creditworthiness in order to pay its financial obligations" (Standard & Poor's, 2012). Credit rating agencies assign credit ratings to firms that reflect their views of the firms' overall capacity and willingness to meet their financial commitments as they come due. In other words, credit ratings represent credit rating agencies' assessments of firms' default risks.

Credit ratings are very important to issuers, investors, and bond analysts. Issuers are concerned about their ratings when they make debt issuance decisions because credit ratings are an indicator of financial distress (Graham and Harvey, 2001). Changes in a firm's credit rating contain information that can explain the excess bond and stock returns in the period around such changes (Holthausen and Leftwich, 1986; Hand, Holthausen, and Leftwich, 1992; Campbell and Taksler, 2003; Kisgen, 2006). Bond analysts also pay close attention to changes in credit ratings. Bond analysts' recommendations are significantly different across different rating categories (De Franco, Vasvari, and Wittenberg-Moerman, 2009). Firms that have higher credit ratings are more likely to receive favorable recommendations from bond analysts.

In addition to the issuers and the investors, regulators and private contracting also rely on credit ratings extensively. For example, the SEC used credit ratings in its amendment to the net capital rule for broker-dealers in 1975. Similar requirements are also made for insurance companies, pension funds and banks. In these cases, credit ratings are used by both regulators and legislators as a tool for measuring and limiting risk.

2.5.2 Methodologies of Credit Rating for Convertible Debt

Credit rating agencies provide corporate ratings that are widely used for purposes of valuation, contracts, and regulation. Their risk assessment of a firm is based on "both quantitative and qualitative factors encompassing business and financial risks of fixed-income issuers and their individual debt issues" (Fitch Corporate Rating Methodology, 2011). The primary source of information that rating agencies use is the public information disclosed by the issuers (e.g., financial statements) (Fitch Corporate Rating Methodology, 2011). The rating agencies claim in their methodology manuals that they adjust financial statements "to better reflect the underlying economics of transactions and events" (Fitch, 2011; Moody's, 2010; Standard & Poor's, 2008b).

The adjustments to financial statements can affect all three primary financial statements: balance sheet, income statement and cash flow statement. The standard adjustments are made according to the applicable accounting standards (Moody's, 2010). The key credit-relevant financial ratios are calculated based on the adjusted financial statements. The rating agencies make the adjustments to financial statements purely for the purpose of improving their analytical value and not to measure compliance with GAAP or IFRS (Moody's, 2010).

Hybrid securities, such as convertible debt, are on the list of adjustments at all three major credit rating agencies. Each of them uses a slightly different mechanism to adjust the leverage and coverage ratios that are most directly affected by the adjustments of convertible debt. However, adjustments to hybrid securities in credit ratings represent a challenge. For example, since 2003, Moody's has placed each convertible debt security on a subjective debt-equity continuum. It assigns weights to the debt and equity components of the convertible debt security based on its terms. There are five baskets of weights used to categorize the debt and

equity components: 100% of debt and 0% of equity, 75% of debt and 25% of equity, 50% of debt and 50% of equity, 25% of debt and 75% of equity, and 0% of debt and 100% of equity. Moody's also adjusts the coverage ratios to reflect any adjustment to interest expense or dividends.[14] Standard & Poor's, on the other hand, changed its methodology in 2006 and 2008 in regard to hybrid securities. Prior to 2006, Standard & Poor's "did not divide the total amount involved in proportion to the equity component of the specific security" because it believed that the division would result in misleading numbers (Standard & Poor's, 2008a). It computed two sets of balance sheet ratios for the principal amount of the hybrid instruments, displaying the principal amount either entirely as debt or entirely as equity. In 2006, Standard & Poor's changed its methodology because the issuers found it difficult to understand the multiple sets of ratios. Convertible debt is not treated as a hybrid security unless the conversion is mandatory (Standard & Poor's, 2008a). In 2008, Standard & Poor's changed its rating methodology for convertible debt again. It classified the equity component of hybrid securities as minimal, intermediate and high. Based on an instrument's category, its principal amount will be divided between debt and equity and the adjustments to the financial statements will be made accordingly (Standard & Poor's, 2008b). Appendix C provides a summary of adjustments made by the three credit rating agencies in order to reflect in their credit assessments the "true" economic substance of convertible debt.

When assessing the credit risks of firms, two of the key financial ratios the rating agencies consider are the leverage ratio and the interest expense coverage. Convertible debt is evaluated as to the extent it contributes to financial flexibility and supports ongoing liquidity needs. The fact that rating agencies make adjustments to firms' reported financial numbers does not mean that the financial statements fail to comply with GAAP or IFRS, but rather is a way to

[14] Adjustments to convertible debt made by credit rating agencies are not publicly available.

improve the analytical value of financial data to the rating agencies (Fitch, 2011; Moody's, 2010; Standard & Poor's, 2008a)**.**

3. Hypotheses Development

The FASB issued APB 14-1 to mandate that firms bifurcate their cash-settled convertible debt and record the interest expense using the effective interest rate method. Such requirements would increase issuers' interest expense and decrease the book value of debt reported on the financial statements starting in 2009 and thereafter as well as for any prior years in which cash-settled convertibles were outstanding. Issuers may avoid reporting higher interest expense if they reduce the amount of outstanding cash-settled convertibles because the bifurcation requirement is not applicable to the amount that is no longer outstanding after the effective date of APB 14-1. Consequently, I first focus my analysis on the issuers' response to the accounting changes.

There are two ways to reduce the amount of outstanding cash-settled convertible bonds. First, issuers have the option to call back the convertibles with shares of common stock or cash on a set of pre-specified dates at a pre-determined price. However, such calls are only allowed by the financing agreements if the call-protection period has expired. Second, issuers can repurchase their cash-settled convertible bonds from the secondary bond market at the market price with their cash. Open market repurchase is a quick solution before the expiration of the call protection period. This study examines cash-settled convertible bonds issued between 2005 and 2011. Since the average number of years for call-protection in my sample is around seven years, most of these cash-settled convertible bonds could not be called back by the issuers in either 2008 or 2009. As a result, issuers in my sample that wanted to respond to APB 14-1 all chose to repurchase their outstanding cash-settled convertible bonds from the open market.

Issuers can settle the repurchase by cash, either from cash reserves generated internally or from new external financing (e.g., new issuances of other types of convertible bonds that are not subject to APB 14-1). Each method has its own benefits and costs. Using cash reserves, firms lose their financial flexibility to fund other investment projects. On the other hand, using external financing to fund the repurchase also has its benefits and costs. For example, if firms have the debt capacity and access to external capital, issuing new convertible bonds that are not subject to APB 14-1 in exchange for cash-settled convertible bonds allows firms to continue to report lower interest expense. However, the cost of issuing new convertible debt can be significant to the issuers. As reported in the SDC database, the average issuing cost (i.e., the difference between the total issuing amount and the total proceeds actually received by the issuers) is $11 million dollars for convertible bonds issued in the U.S. market, which is about 3% of the issuing amount. Firms can also choose to issue equity to raise funds for the repurchase of cash-settled convertible bonds. However, it is much more expensive to do so either in the IPO market or the SEO market. The average underwriting spreads are 7% and 5%, respectively (Kim, Palia, and Saunders, 2003). In addition to the monetary cost of issuing bonds and equity, the global financial crisis of 2008 made it hard to obtain any type of external financing. Bank loans to large borrowers fell by 68% in 2008 as compared to 2007 (Ivashina and Scharfstein, 2010). According to the SDC database, new issues of bonds and equity dropped by 26% and 60%, respectively.

The use of accounting-based numbers in debt contracts minimizes the agency costs associated with these contracts (Smith and Warner, 1979; Leftwich, 1983). When mandatory accounting changes are included in the calculation of debt covenant compliance, it may unexpectedly increase the probability of violating debt covenants that are based on the reported accounting earnings. To avoid costly consequences of violating debt covenants (e.g., higher

interest rates and restrictions on future investing and financing activities), managers may change their financing or operating activities to minimize the probability of technical default (Leftwich, 1983; Watts and Zimmerman, 1990; Mittelstaed, Nicholes, and Regier, 1995). APB 14-1 requires that cash-settled convertibles be bifurcated into debt and equity components. The direct impact is higher reported interest expense (or lower interest coverage ratios) and lower reported leverage ratios. Issuers can avoid reporting higher interest expense by reducing the outstanding amount of cash-settled convertible debt. On the other hand, keeping cash-settled convertible debt on the balance sheet would provide a lower reported leverage ratio relative to using other types of debt instrument. This is an attractive feature of cash-settled convertible debt because lower leverage provides more debt capacity and financial flexibility.

Given the two opposite effects of APB 14-1 on earnings and leverage ratios, I expect that cash-settled convertible debt issuers would evaluate the trade-offs between the favorable and the unfavorable outcomes of APB 14-1. Depending on which effect dominates, they will determine whether to keep or repurchase their outstanding cash-settled convertible debt. This expectation can be expressed as the following hypotheses (in alternative form):

> *H1a*: Issuers of cash-settled convertible debt are more likely to repurchase their outstanding cash-settled convertible debt when the increase in interest expense is greater.
>
> *H1b*: Issuers of cash-settled convertible debt are less likely to repurchase their outstanding cash-settled convertible debt when the reduction of the leverage ratio is greater.

In addition to the changes in the recognition and measurement methods, APB 14-1 also changes the disclosure requirements of cash-settled convertibles, changes that are "intended to provide users of financial statements with information" to better understand the underlying economics of cash-settled convertible debt. Accounting numbers provide useful information for

both equity investors and credit investors to assess the value and the risks of a firm (Watts and Zimmerman, 1990). Prior studies generally support the view that investors and creditors can understand the economic substance of hybrid financing instruments. Empirical studies show that the market perception of hybrid securities, measured by the relation between systematic risk and the leverage ratio, is conditioned on the economic substance of such hybrid securities (Kimmel and Warfield, 1995; Cheng, Frischmann, and Warfield, 2003). These studies hypothesize that to the extent that investors perceive that certain features make a hybrid security more debt-like, then the observed relation between these hybrid securities and systematic risk (or stock prices) should be similar to the relation between debt and systematic risk. Carrizosa (2010) provides evidence that neither creditors nor shareholders naively view convertible debt as simple straight debt. They seem to distinguish between the debt and equity components of convertible debt in their valuation process. Using adjusted financial data from Moody's, studies by De Franco, Wong, and Zhou (2011) and Kraft (2012) find that both stock returns and credit ratings, respectively, are associated with these adjustments.

In my study, I focus on whether the mandatory bifurcation of cash-settled convertible bonds improves the informativeness of accounting numbers used by credit rating agencies. The top two financial ratios used by credit rating agencies in evaluating default risks are interest coverage and leverage ratios (Moody's, 2010). Bifurcation of cash-settled convertibles under APB 14-1 has a direct impact on both interest coverage and leverage ratios. Ratios are calculated using the accounting numbers reported in the financial statements ("reported ratios"). Both ratios are important factors determining credit risk and are highly relevant to credit ratings. I use credit ratings as a proxy for the credit market's evaluation of the firm.[15] I define the period after

[15] Credit ratings may respond slowly to new information, but they are a focal point for financial markets (Hand, Holthousen, and Leftwich, 1992; Kisgen, 2006). In addition, rated firms make up a large fraction of the asset-

(before) the adoption of APB 14-1 as the post-2008 (pre-2008) period. One of the goals of APB 14-1 is to provide useful information to the users of financial statements to enable them to better understand the true economics of cash-settled convertible debt. The post-2008 interest coverage and leverage ratios for cash-settled convertible debt, calculated based on the reported numbers taken from the financial statements, are expected to be more informative to the evaluation of credit risks of the issuers than the pre-2008 ratios. Following this reasoning, my second hypothesis is (in alternative form):

> *H2*: The reported interest coverage and leverage ratios are more relevant to credit ratings in the post-2008 period than they are in the pre-2008 period.

As discussed above, prior to the adoption of APB 14-1, all three major credit rating agencies claim in their rating methodology manuals that they adjust the accounting numbers reported on the financial statements when they assess the credit risk of convertible debt issuers (Standard and Poor's, 2008; Moody's, 2010; Fitch, 2011). These adjustments are often made based on the analysts' judgments. It is not exactly clear how they apply their methodologies to perform the adjustments from their published manuals. As explained earlier, these adjustments are not publicly available. Therefore, I calculate "as-if" adjusted ratios based on the methodology required by APB 14-1.

If I can calculate "as-if" adjusted ratios in the pre-2008 period using publicly available data, then the credit rating agencies could have done the same. Although the credit rating agency adjustments are not available to the public, as long as there is some correlation between my "as-if" adjustments and the credit rating agency adjustments, I expect adjusted interest coverage and

---

weighted universe of public non-financial firms. Almost 95% of the total debt (and 90% of total assets) on the balance sheet of public non-financial firms is on the balance sheet of firms that were rated for at least one year between 1996 and 2006 (Rauh and Sufi, 2010).

leverage ratios to be more relevant to credit ratings than the reported ratios in the pre-2008 period.

As explained in Appendix A, there is some noise in researcher-calculated "as-if" adjusted ratios compared to actual bifurcation. If this was not so, one would not expect any benefit from APB 14-1 because complete bifurcation adjustments were possible in the pre-2008 period. Accordingly, I expect reported ratios in the post-2008 period to be more relevant to credit ratings than the "as-if" adjusted ratios.

Based on the above, I predict the following (in alternative form):

H2a: The adjusted interest coverage and leverage ratios are more relevant to credit ratings than the reported ones in the pre-2008 period.

H2b: The reported interest coverage and leverage ratios in the post-2008 period are more relevant to the credit ratings than the adjusted ratios in the pre-2008 period.

4. Sample Selection and Research Design

4.1 Sample Selection

I collect U.S. convertible debt issuances data from the Securities Data Company (SDC) for the period from 2005 to 2011. Following prior studies, I exclude firms from the financial industry (SIC code 6000 to 6999) and the utilities industry (SIC code 4900 to 4999). As indicated in Panel A of Table 1, this process generates an initial sample of 511 new issuances of convertible debt from 2005 to 2011, representing 390 unique firms. I then manually search the SEC filings (e.g., 10-Ks, 10-Qs, 8-Ks, and Registration Statements) to collect additional information on the characteristics of these convertible debt issuances.[16]

[16] I hand collect the following information from issuers' public fillings. First, I collect the details of the convertible debt offerings, such as method of settlement and call schedule. Second, I collect repurchase-related information (e.g., year of repurchase, source of funding, and gain or loss of repurchase). Third, I obtain the actual discount rate that issuers use to calculate the present value of the debt component of the convertible bonds. Lastly, I collect

I obtain financial data and S&P ratings from Compustat, public bonds' covenants data from Mergent FISD, stock returns data from CRSP, and institutional ownership data from Thomson Reuters. I eliminate observations with missing data required for the main tests. As indicated in Panel A of Table 1, this process reduces the number of new convertible debt issuances in my sample to 477, representing 360 unique firms. Among these 477 new issuances, 359 are cash-settled convertible debt, representing 279 unique firms. Panel B of Table 1 reports the industry composition of firms issuing convertible debt. Sample firms are distributed across different industries, exhibiting some industry concentration in business services (12.53%), chemicals and allied products (14.48%), and electronic and other electrical equipment (13.65%).

4.2. Research Design

In this section, I perform tests to examine the economic consequences of the accounting rule changes for cash-settled convertible debt.

4.2.1 Issuers' Response to APB 14-1

I first study the decision by managers to reduce the outstanding amount of cash-settled convertibles after the adoption of APB 14-1. First, I examine the determinants of repurchase for all convertible bond issuers (i.e., issuers of both cash-settled and non-cash-settled convertible bonds) using the following probit model:

$$\begin{aligned} Pr(Repurchase)_{it} = {} & \gamma_0 + \gamma_1 CashSettle_t + \gamma_2 InterestCoverage_{it+1} + \gamma_3 Lev_{it+1} + \gamma_4 EPS\_dilution_{it+1} \\ & + \gamma_5 EarlyRedeem_{it} + \gamma_6 Size_{it+1} + \gamma_7 ROA_{it+1} + \gamma_8 Cash_{it+1} + \gamma_9 CAPX_{it+1} \\ & + \gamma_{10} Public_{it} + \varepsilon_1 \end{aligned} \quad (1)$$

Next, I estimate the same probit model for cash-settled convertible bond issuers in order to see whether the issuer's decision to repurchase is affected by the impact of APB 14-1 on interest expense and leverage. Following the methodology provided in the APB 14-1, I am able

information about the impact of APB 14-1 on interest expense and leverage ratios that issuers disclosed starting in fiscal year 2009. This information is used in the empirical tests in this study.

to directly measure the magnitude of impact on interest coverage and leverage ratios. Thus, I modify Eq. (1) as below:

$$\begin{aligned} Pr(Repurchase)_{it} = {} & \gamma_0 + \gamma_1 InterestImpact_{it+1} + \gamma_2 LevImpact_{it+1} + \gamma_3 EPS\_dilution_{it+1} \\ & + \gamma_4 EarlyRedeem_{it} + \gamma_5 Size_{it+1} + \gamma_6 ROA_{it+1} + \gamma_7 Cash_{it+1} \\ & + \gamma_8 CAPX_{it+1} + \gamma_9 Public_{it} + \varepsilon_2 \end{aligned} \quad (2)$$

The dependent variable in these two models, *Repurchase*, is an indicator variable that equals one if the firm repurchased any amount of its outstanding cash-settled convertible debt during 2008 or 2009, zero otherwise. The independent and control variables are measured in 2009 and 2010, except for *CashSettle*, *EarlyRedeem* and *Public* which are measured in 2008 and 2009. I argue that managers make business decisions (e.g., how to adjust capital structure) in year *t* while bearing in mind the impact of APB 14-1 on firms' financials in year *t*+1. Therefore, I use the realized one-year-ahead values as proxies of values expected when the repurchase decision was made. In Eq. (1), *CashSettle* is an indicator variable that equals one if issuers commit to cash-settlement upon conversion, zero otherwise. Since the bifurcation requirement is only applicable to cash-settled convertible bonds, I predict that issuers of cash-settled convertible bonds are more likely than issuers of non-cash-settled convertible bonds to take actions in response to the impact of APB 14-1 on interest expense and leverage. Thus, I expect a positive coefficient on *CashSettle*. Firms that have a high level of debt are more likely to repurchase their debt in order to release their debt capacity and regain financial flexibility. Thus, I expect a positive relation between firms' leverage (*Lev*) and *Repurchase*. Because APB 14-1 impacts both interest expense and earnings, the interest coverage ratio (*InterestCoverage*) is expected to be affected by the repurchase of cash-settled bonds. I expect that firms with higher *InterestCoverage* are less likely to respond to APB 14-1 by repurchase of cash-settled convertible bonds because they are able to bear the cost of keeping these convertible bonds. I

define *Lev* as book value of total liabilities divided by total assets, and *InterestCoverage* as earnings before interest and taxes divided by total interest expense. In Eq. (2), *InterestImpact* and *LevImpact* are the variables of interest. *InterestImpact* is calculated as the ratio of the increase in interest expense resulting from the bifurcation process to the firm's EBIT in a given year. *LevImpact* is calculated as the ratio of reduction in total debt under APB 14-1 to total assets. Both serve as proxies for the impact of APB 14-1. I expect a positive relation between *Repurchase* and *InterestImpact* and a negative relation between *Repurchase* and *LevImpact*.

Marquardt and Wiedman (2007) find that firms are more likely to repurchase or restructure their contingent convertible bonds (hereafter "COCOs") when the perceived benefit in the diluted EPS calculation is higher.[17] Similarly, I define the variable *EPS_dilution* as the difference between the reported diluted EPS figure for the year and the comparable figure as if all outstanding cash-settled convertible bonds were included in the diluted EPS, scaled by share price. This variable is included in the models to control for the potential loss of recording higher diluted EPS, if there is any, because the FASB allows firms to exclude the cash-settled convertible debt from the calculation of diluted EPS figures even after the adoption of APB 14-1. This variable serves as a proxy for the costs of repurchase to the issuers. *EarlyRedeem* is included to control for the call-protection feature of cash-settled convertible debt. It is an indicator variable that equals one if the issuers are allowed to redeem the cash-settled convertible debt before the maturity date, zero otherwise.

I include firm characteristics to control for the issuers' ability to bear the costs of repurchase (Marquardt and Wiedman, 2007). I include firm size in the analyses of firms'

[17] COCOs are convertible bonds that cannot be converted into shares of common stock until a pre-specified stock price threshold is reached. The FASB changed its accounting for COCOs in 2004 to remove the favorable treatment in the diluted EPS calculation (EITF 04-8). Prior to this change, COCOs could be excluded from the calculation of diluted EPS.

decisions to repurchase. *Size* is defined as the log of total assets at the end of each fiscal year. Firms' profitability can affect their ability to induce exchanges in the open market by providing attractive prices to the holders of the cash-settled convertible bonds. Therefore, I include firms' *ROA*, where *ROA* is defined as EBIT divided by the average total assets during the fiscal year. *Cash* is the amount of cash reported on the balance sheet divided by total assets. It is included to control for the level of cash reserves available for convertible debt repurchase. *CAPX* is the amount of capital expenditure in the year, scaled by total assets. Firms need to raise new capital to fund new investment projects. This capital can come from cash generated by normal business or from equity or debt financing. Thus, it is included to control for firms' financing needs. *Public* is an indicator variable that equals one if the debt is publicly issued, zero otherwise. Generally, it is more costly to call and redeem public debt than private debt due to its dispersed ownership.

4.2.2 Impact of Financial Constraint

The sample period in this study overlaps with the 2008 financial crisis. During this period, firms were credit constrained because of the significantly less capital available in the market. Both private bank loans and public financings fell significantly (Campello, Graham, and Harvey, 2010; Ivashina and Scharfstein, 2010). Small firms and growth firms that were usually the issuers of cash-settled convertible bonds were affected more negatively by the credit crunch. The presence of financial constraints may manifest itself in capital structure decisions that firms make. To assess whether financial constraints affect a firm's decision to repurchase cash-settled convertible bonds, I include in Eq. (2) a variable, *rankFinConst*, which is estimated using the methodology in Lamont, Polk, and Saa-Requejo (2001).[18] This index is higher for firms that are

[18] Lamont, Polk, and Saa-Requejo (2001) regress investment on firm characteristics, including cash flow, Tobin's Q, leverage, dividends and cash holding scaled by book value of assets using the sample from Kaplan and Zingales

more financially constrained. As firms become more financially constrained, their investment spending and financial flexibility decline. Since firms need cash to repurchase, those that are financially constrained may not be able to do so. I expect that financially constrained firms are less likely to repurchase their outstanding cash-settled convertible bonds because they want to hold cash for precautionary reasons.

4.2.3 Credit Rating Agencies' Response to APB 14-1

I next study whether APB 14-1 helps credit rating agencies better assess the risk of cash-settled convertible debt. I follow the methodology in Ashbaugh-Skaife, Collins, and LaFond (2006) to construct credit ratings for my sample firms. I use the long-term credit ratings from S&P. The ratings range from AAA to D. The multiple ratings are collapsed into seven categories ranging from 1 (lowest level) to 7 (highest level). I then estimate the following ordered logit model:

$$CreditRating_{it} = \delta_0 + \delta_1 InterestCoverage_{it} + \delta_2 Lev\_MV_{it} + \delta_3 Size_{it} + \delta_4 Loss_{it} + \delta_5 CAP\_Inten_{it} + \delta_6 InstOwn_{it} + \varepsilon_3 \quad (3)$$

I use ordered logit models because there are seven categories of ratings and they convey ordinal risk assessments (Ashbaugh-Skaife, Collins, and LaFond, 2006). The changes in benefits or costs between rating categories are not uniform.[19] *InterestCoverage* and *Lev_MV* are interest coverage ratio and leverage ratio calculated using the results from financial statements. Because credit rating agencies all claim that they adjust firms' reported interest coverage and leverage ratios to reflect the true economic characteristics of convertible debt, I separately test for reported and adjusted ratios using Eq. (3). The adjusted interest coverage ratio, *adjInterestCov*, is

(1997). They then construct a financial constraint index using the coefficients from this regression. This index is calculated as: -1.001909 * *CashFlow/Assets* + 3.139193 * *LTDebt/Assets* – 39.36780 * *Dividends/Assets* – 1.314759 * *Cash/Assets* + 0.2826389 * *Tobin's Q*. I rank the firms by their index each year into tertiles. The top tertile is defined as "constrained", and the bottom tertile is defined as "unconstrained."

[19] I also estimate Eq. (3) using OLS regressions (Ederington, 1985). Interpretations of the results from the OLS regressions (untabulated) are consistent with those from the ordered logit models.

calculated as a firm's EBIT divided by the reported interest expense adjusted for the amount of debt discount amortization. The debt discount amortization results from the separation of the debt and equity components of the convertible debt and is calculated using the effective interest rate method as required by APB 14-1. The adjusted leverage ratio, *adjLev_MV*, is calculated using the reported long-term debt, adjusted for the reduction of the equity portion of cash-settled convertible debt. Both *InterestCoverage* and *adjInterestCov* are expected to be positively related to credit ratings, while *Lev_MV* and *adjLev_MV* should be negatively related to credit ratings.

I also control for factors that have been shown to be associated with credit ratings in prior studies (Ashbaugh-Skaife, Collins and LeFond, 2006; Kraft, 2012). Firm size (*Size*) is included as a control variable. *Loss* is an indicator variable which equals one if firms report losses in both current and prior years, zero otherwise. *CAP_Inten* is the firm's capital intensity calculated as the total value of property, plant and equipment divided by total assets. It is included to control for a firm's asset structure. Ownership structure variables (*InstOwn*) are included to control for institutional investors' influence on management.

5. Empirical Results

5.1 Descriptive Statistics

Table 2 presents the total proceeds received by U.S. public firms in the U.S. market during the sample period, including those from new issuances of cash-settled convertible debt, the sum of cash and equity-settled convertible debt, and straight debt. Over the seven years from 2005 to 2011, the total proceeds received from the issuances of cash-settled convertible debt are $157 billion dollars. This is 86% of the total proceeds from both cash and equity-settled convertible debt issuances, and is equal to 10% of total proceeds from all straight debt issuances.

This suggests that cash-settled convertible debt is an economically important source of financing. The debt market experienced serious credit constraint during the 2008 financial crisis. This is supported by the decrease in new issuances of both convertible and straight debt starting in 2008. The total number of firms issuing cash-settled convertible debt increased 92%, from 49 in 2005 to 94 in 2007. However, the number of new issuances of cash-settled convertible debt dropped sharply from 94 issues in 2007 to 36 issues in 2008, a decrease of 61%. Similarly, total proceeds received from new issuances of cash-settled convertible debt dropped from $41 billion dollars in 2007 to $13 billion dollars in 2008, representing a 200% decrease. New issuances of straight debt can be used to estimate the overall credit availability in the market. However, new issuances of straight debt only dropped 26% during the same time period, significantly lower than the 200% for cash-settled convertible debt. Thus, taking into consideration the credit crunch for all debt financing during the financial crisis period, cash-settled convertible debt became less attractive to issuers after the FASB issued APB 14-1 in 2008.

Table 3 provides descriptive statistics for new issuances and issuers of convertible debt during the sample period. Panel A shows that 73% of new issuances contain a cash settlement feature. Of these new issuances, 44% allows for redemption prior to the maturity date if certain criteria are met (e.g., a stock price target or sales growth target). Panel B of Table 3 reports the univariate comparisons between the subsamples of new issuances from the pre-2008 and post-2008 periods. Firms issued 27% more cash-settled convertible debt in the pre-2008 period than in the post-2008 period (*t*-statistic = -6.84). The average total proceeds received from new issues in the post-2008 period are $131 million dollars less than those received from the pre-2008 issuances (*t*-statistic = -3.01). The coupon rates of post-2008 issuances are significantly higher than the pre-2008 ones. The mean value of the increase in coupon rate is 1.61%, and is

statistically significant at the 1% level. These statistics suggest that the issuances of cash-settled convertibles in the post-2008 period were less attractive to firms. Panel C reports firm characteristics. On average, bifurcation of cash-settled convertible bonds increases interest expense by $5.7 million dollars or about 8% of earnings each year. At the same time, the level of reduction in leverage is about 5% each year. About 41% and 28% of these firms incurred losses in 2009 and 2010, respectively.

In Table 4, I present the number of unique firms that initiate the repurchase of outstanding cash-settled convertible debt in a given year. If a firm repurchased more than once during the sample period, it is only included in the first year it did so. I observe a sudden jump in the number of firms from two in 2007 to 29 in 2008 and 36 in 2009. In 2008 and 2009, 65 firms started to repurchase their outstanding cash-settled convertible debt. The highly clustered repurchases in 2008 and 2009 suggest that issuers took immediate actions in response to the adoption of APB 14-1. Such decisions were most likely made by firms after the evaluation of the joint impact on reported earnings and on leverage ratios.

Table 5 reports the debt contracting practices for 215 sample firms that are matched with the Mergent FISD public debt database and 105 sample firms that are matched with the Nini, Smith, and Sufi (2009) credit agreements database. Panel A presents the frequencies of certain debt covenant terms used in the sample firms' public straight debt contracts. On average, 10% of the 215 sample firms identified include a fixed charge covenant in their public bonds contracts. Of these 215 firms, 28% contain a covenant restricting new debt issuance. Panels B and C report the debt covenant details used in the bank loan agreements of convertible bond issuers and cash-settled convertible bond issuers, respectively. I follow the methodologies from prior studies (Beatty, Ramesh, and Weber, 2002; Christensen and Nikolaev, 2013) and categorize the contract

treatment of GAAP changes into four groups: rolling GAAP, rolling GAAP for voluntary accounting changes, frozen GAAP, and frozen GAAP on-request. Examples of each contracting practice are provided in Appendix E. Panel B reports that 33% of the 105 sample firms that issued convertible bonds use rolling GAAP in their bank loan agreements, which include the mandatory GAAP changes in the calculation of debt covenant compliance. This percentage is higher than the 27% and 26% reported by Beatty, Ramesh, and Weber (2002) and Christensen and Nikolaev (2013), respectively. Among the 61% of firms whose bank loan agreements exclude GAAP changes, 10% unconditionally exclude GAAP changes and 51% exclude GAAP changes at the request of either the lender or the borrower.

5.2 Multivariate Tests

5.2.1 Repurchase of Cash-Settled Convertible Debt

Table 6 presents the results of the probit models in Eq. (1) and Eq. (2). I start with the new convertible debt issued before the beginning of fiscal year 2009. I then examine whether the decision of issuers to repurchase is associated with the impact of APB 14-1 during different time frames. APB 14-1 only applies to cash-settled convertible debt that is outstanding after the effective date of December 15, 2008. Therefore, I conjecture that firms were most likely to repurchase their outstanding cash-settled convertibles in 2008 or 2009. Firms likely decided to respond to such accounting changes immediately before the effective date of the accounting changes in 2008, or immediately after 2008 but before the end of fiscal year of 2009, to avoid recording higher interest expense in fiscal years 2008 or 2009. In untabulated analyses, I perform tests within different time windows after the adoption of APB 14-1 and the results are consistent with my conjectures.

I separately test for the sample of all convertible issuances and a subsample of cash-settled convertible issuances. First, I estimate Eq. (1) for the sample of all convertible debt issuances in order to identify whether cash-settled convertible debt is more likely to be repurchased than non-cash-settled convertible debt. The results shown in Column 5 of Table 6 provides weak evidence that, for 2008, cash-settled convertible issuances, as proxied by the indicator variable *CashSettle*, are more likely to be repurchased than non-cash-settled convertible debt. The coefficients on *CashSettle* in 2008 is 0.554, which is significant (one-sided) at the 10% level. As evidenced in Column 6 of Table 6, there are no differences in the likelihood of repurchase across the two types of convertibles in 2009.

Columns 1 to 4 in Table 6 show the estimation results of Eq. (2) for repurchases made by cash-settled convertible debt issuers in 2008 and 2009, respectively. Both *InterestImpact*, which measures the impact of increased interest expense on firm's earnings, and *LevImpact*, which measure the impact of the reduction in firms' leverage ratios, are significantly associated with the likelihood to repurchase in both years with the predicted signs. Such associations are the strongest if firms repurchased in 2008, immediately before the adoption of APB 14-1, as shown in Column 1. The coefficient on *InterestImpact* is 1.824 (p-value < 0.05, one-sided) and the coefficient on *LevImpact* is -9.598 (p-value < 0.01, one-sided). In 2009, the coefficients on both *InterestImpact* and *LevImpact* slightly drop to 1.620 and -9.301, respectively (p-value < 0.05 and < 0.01, respectively). I also estimate the economic magnitude of *InterestImpact* and *LevImpact*. In 2008, one standard deviation increase in *InterestImpact* increases the probability of repurchase by 0.04, and one standard deviation increase in *LevImpact* decreases the probability of repurchase by 0.08. Smaller and less profitable firms are more likely to repurchase their outstanding cash-settled convertible debt, which suggests that these firms are less able to absorb

the negative impact of APB 14-1 on their earnings. *EPS_dilution* is positively associated with the likelihood of cash-settled convertible debt repurchases in 2008. The coefficient on *EPS_dilution* in 2008 is 48.678, significant at the 10% level. This suggests that firms that repurchased the cash-settled convertibles face greater losses in their diluted EPS figures than firms that did not repurchase the cash-settled convertible debt.

The call-protection feature, *EarlyRedeem*, does not affect the firms' decisions to repurchase. In addition, whether the cash-settled convertible debt is public or not, as proxied by *Public*, is not associated with the likelihood of repurchases of cash-settled convertibles. The lack of significance for either *EarlyRedeem* or *Public* suggests that firms would repurchase cash-settled convertible bonds from the open market rather than waiting for the call-protection period to expire. *Cash* does not seem to relate to the likelihood of repurchases. The *t*-statistics are -0.01 and 0.01 for 2008 and 2009, respectively. This suggests that firms use their cash reserves to repurchase outstanding cash-settled convertible debt, no matter the size of their cash reserves. In addition, firms with higher capital expenditures are more likely to repurchase in 2008. The coefficient on *CAPX* in 2008 is 0.001 (p-value <0.01). In a survey of 1,050 CFOs around the world, Campello, Graham, and Harvey (2010) document that firms often bypass attractive investment projects due to difficulties in raising external financing and generating internal cash flows, which is especially true during my sample period. Firms are expected to maintain their existing external financing to fund daily operations or new investment projects. Thus, this positive relation between capital investment and repurchase of outstanding convertible debt is surprising.[20] One possible explanation is that managers have strong incentives to take real actions

[20] I also control for alternative financing (e.g., issuing new equity or other debt) and the interaction term of alternative financing and *CAPX* in year *t*+1 in both Eq. (1) and Eq. (2). Untabulated results show that the effects of *InterestImpact* and *LevImpact* are unchanged in Table 6 in both 2008 and 2009.

to mitigate the impact of APB 14-1 on their earnings, even when they are in need of financing to fund new capital investment projects.

I also report the results from the same models while controlling for firms' financial flexibility. The financial constraint measure, *rankFinConst*, is not significant in either 2008 or 2009 within either the cash-settled or full convertible sample. For example, Columns 2 and 4 report the coefficients within cash-settled convertible issuances in 2008 and 2009, which are 0.060 and 0.185, respectively (both *p*-values > 0.10). Controlling for firms' financial constraint does not change the significant associations between the two impact variables, *InterestImpact* and *LevImpact*, and the decision to repurchase cash-settled convertible bonds. This indicates that such repurchases do not depend on whether firms have extra cash on hand. They are indeed costly to firms.[21]

Overall, results from Table 6 support my first set of hypotheses (H1a and H1b). Issuers repurchase their cash-settled convertibles in response to the impact of APB 14-1 on their reported earnings and leverage ratios.

One potential explanation for the results in Table 6 is that firms are concerned with debt covenants.[22] Descriptive statistics in Table 5 show that covenants on interest coverage or leverage ratios are commonly used in sample firms' bank loan agreements. Within a subsample of 105 firms with bank loan agreements available during the sample period, 33% of them use rolling GAAP treatment to account for the mandatory accounting changes in the calculation of

[21] I re-estimate Eq. (1) and Eq. (2) where dependent variable is the ratio of amount repurchased to total amount issued. The results are consistent with those in the main tests.

[22] Prior studies of managerial response to accounting standard changes propose two contracting hypotheses: debt contract and CEO bonus plans (Leftwich, 1983; Marquardt and Wiedman, 2007). In this study, I focus on the debt contract hypothesis. APB 14-1 requires bifurcation of cash-settled convertible bonds. This affects interest expense and leverage which are both important numbers used in debt contracts as restrictive covenants. The incentive facing managers to increase reported earnings go beyond debt contracting related incentives and include perceived job tenure, potential bonus impact and possible stock price impact if the manager perceives that investors will react in a negative way to lower earnings. I leave the explanation of these various incentives to future research and focus only on debt contracting related incentives in this study.

debt covenant compliance. I re-estimate Eq. (1) and Eq. (2) by adding an indicator variable *RollingGAAP*, which equals one if a firm's bank loan agreement uses rolling GAAP, zero otherwise. In untabulated analyses, I find that the positive relation between *InterestImpact* and firms' decisions to repurchase in 2009 becomes stronger when firms' bank loan agreements use rolling GAAP.[23] The results provide supporting evidence that certain debt contracting practices increase firms' concerns about the potential impact of APB 14-1. The probability of covenant violation is unexpectedly increased by the changes in accounting treatment of cash-settled convertible debt.

In the analyses above, I examine an issuer's decision to repurchase outstanding cash-settled convertible debt in year *t* when looking at realized values of explanatory variables in year *t*+1. Using realized values as proxies for expected values may raise a concern regarding look-ahead bias. To address this potential issue, I predict each of the control variables at year *t* using the realized values from years *t*−5 to *t*−1. In untabulated results, I perform two sets of additional analyses. First, I examine the correlations between the realized values at year *t* and the predicted values. I find that the realized values are statistically significantly correlated with the predicted ones at the 1% levels with correlation coefficients ranging from 0.30 to 0.99. Second, I re-estimate both Eq. (1) and Eq. (2) using the predicted values of the explanatory variables. The results are consistent with the main tests shown in Table 6.

5.2.2 Credit Rating Tests

In Table 7, I report whether APB 14-1 improves the credit market's understanding of cash-settled convertible debt. I perform ordered logit regressions for Eq. (3) to test whether the adoption of APB 14-1 changes the relevance of interest coverage and leverage ratios to credit

[23] To mitigate the multicollinearity among control variables, I center the control variables at their mean values. I find a positive (negative) coefficient on the interaction term of *InterestImpact* (*LevImpact*) with the indicator of rolling GAAP (*RollingGAAP*).

ratings. Columns 1 and 2 show the results for cash-settled convertible debt issuers before the end of fiscal year 2008. Neither reported nor adjusted interest coverage is significantly related to credit ratings. On the other hand, both reported and adjusted leverage ratios are statistically significant and obtain the predicted signs. The coefficients on *InterestCoverage* and *Lev* are not statistically different from the coefficient on *adjInterestCov* and *adjLev_MV* at conventional levels in the *F*-test (*p*-values are 0.21 and 0.57, respectively). In summary, two null results emerge. First, somewhat surprisingly, *adjInterestCov* is not associated with credit ratings in the pre-2008 period. Second, *adjLev_MV* is not more associated with credit ratings in the pre-2008 period than *Lev_MV*.

A possible explanation for the above two null results could be that the "as-if" adjustments to accounting ratios (i.e., adjustments calculated based on the effective interest rate method as required by APB 14-1) bear little resemblance to credit rating analysts' adjustments before the accounting changes in 2008. If credit ratings are assigned based on these noisy estimates, then the researcher's "as-if" adjustments made based on the effective interest rate method as required by APB 14-1 may not be incrementally informative.

An alternative explanation for both null results discussed above is that the "as-if" adjustments are themselves noisy. I eliminate this possibility in the following way. I compute *adjInterestCov* and *adjLev_MV* in the post-2008 period in a manner identical to the calculation of those measures in the pre-2008 period. My "as-if" bifurcated numbers and the actual reported numbers are highly correlated. For example, the Spearman correlation coefficient between *adjInterestCov* and *InterestCoverage* is 0.92 and is statistically significant at the 1% level.

Column 3 presents the results for Eq. (3) after 2008. After the adoption of APB 14-1, firms' reported interest coverage and leverage ratios should already reflect the adjustments for

the bifurcation of cash-settled convertible debt. Results in Column 3 show that both *InterestCoverage* and *Lev* are significantly associated with credit ratings in the predicted directions. The reported interest coverage ratio is more relevant to credit ratings in the post-2008 period than both the reported and adjusted interest coverage ratios in the pre-2008 period. Using *F*-tests, the coefficient on *InterestCoverage* in the post-2008 period are statistically higher than those on *InterestCoverage* and *adjInterestCov* in the pre-2008 period (*p*-values are 0.02 and 0.04, respectively). I also compare the relevance of post-2008 *Lev_MV*, pre-2008 *Lev_MV*, and pre-2008 *adjLev_MV* to credit ratings. Using *F*-tests, the coefficients are statistically indistinguishable (*p*-values are 0.70 and 0.80 respectively). Overall, these comparisons suggest that the bifurcation requirement in APB 14-1 does improve the credit rating agencies' assessments of interest coverage but not balance sheet leverage, for cash-settled convertible debt.[24] One possible explanation for lack of balance sheet improvements post 2008 in associations between credit ratings and leverage ratios is as follows. The adjustments were less dramatic for reported leverage than for reported interest coverage. For example, results in Panel C of Table 3 indicate that the decline in leverage as a result of bifurcation, as measured by *LevImpact*, is on average 5%. In contrast, interest expense scaled by EBIT, as measured by *InterestImpact*, increases by 8% as a result of bifurcation.

Larger firms are associated with higher credit ratings in both the pre- and post-2008 periods. For example, the coefficient on *Size* in Column 1 of Table 7 is 1.730 (*p*-value < 0.01). In the pre-2008 period, *Loss* is negatively associated with credit ratings (*p*-value < 0.01). This suggests that firms that report a loss in both the current year and the prior year are associated with lower ratings because their default risks are expected to be higher. Neither *CAP_Inten* nor *InstOwn* is associated with firms' credit ratings in either the pre- or post-2008 period.

[24] I re-estimate Eq. (3) using firm characteristics from *t*-1 and the results do not change.

5.2.3 Shareholder Wealth Effects Associated with APB 14-1

Thus far, my results point to real economic impact arising from the adoption of APB 14-1 and the inability of credit analysts to make complete adjustments to the accounting information they use prior to 2008. These results suggest that there could have been negative shareholder wealth effects associated with the announcement that APB14-1 would be adopted. As such, my event study tests represent a consistency check of my earlier results discussed above.

I select five events using the same methodology in Lewis and Verwijmeren (2010).[25] They are listed in Panel A of Table 8. Following the event study methodology in Schipper and Thompson (1983), I estimate the excess returns around the two-day period (0,1) of the announcement of each event within firms that issued cash-settled convertibles before January 29, 2007 (the first event date). The non-event date period runs from January 1, 2006 to December 31, 2007. I then calculate the cumulative mean excess returns across all five events.

As shown in Panel B of Table 8, I find a significant cumulative excess return of -0.21% for the issuers of cash-settled convertible bonds. The magnitude of the effect over the 10 event days is about -2.1%, which is similar to the findings from prior studies of mandatory changes in accounting standards (Marquardt and Wiedman, 2007; Lewis and Verwijmeren, 2010). The average market value of the pre-2008 cash-settled convertible issuers in my sample is around $5 billion, which implies an overall loss in shareholders' value of $100 million (e.g., -2.1% × $5 billion). I also perform the same event study for two subsamples of firms that had cash-settled convertible bonds outstanding on the first event date. One group of firms uses rolling GAAP in their bank loan agreements; the other group does not. The cumulative abnormal returns within the subsample of firms that uses rolling GAAP is -0.27% (or -2.7% over 10 event dates), which is statistically significantly more negative than the -0.18% in the non-rolling GAAP group (*z*-

[25] Please refer to Lewis and Verwijmeren (2010) for a detailed selection procedure and predictions for each event.

statistic = 12.87). The negative shareholder reactions to the selected events corroborate my results in the repurchase tests. Shareholders of firms that issue cash-settled convertible debt view the accounting changes as costly to the firms. In addition, shareholders react even more negatively if firms use rolling GAAP in their bank loan agreements to calculate debt covenant compliance. In order to mitigate the potential impact of the accounting changes on earnings and debt covenant violations, firms repurchase the outstanding cash-settled convertible debt before the effective date of the new accounting standard.

6. Robustness Tests and Sensitivity Analyses

6.1 Firms' Investment Efficiency and Repurchase Decision

Prior studies show that during the 2008 financial crisis, corporate capital investment activities (e.g., equity and debt financing) were significantly affected. Bank lending fell by 79% in 2008 relative to 2007 (Ivashina and Scharfstein, 2010). New issuances of debt and equity also fell significantly in 2008. The difficulty of borrowing externally potentially caused firms to give up investment opportunities that were attractive. Campello, Graham, and Harvey (2010) survey 392 corporate CFOs and find that both financially constrained and unconstrained firms cancel or postpone attractive investments due to the inability to obtain external financing. Thus, firms were more likely to deviate from the expected level of investment, which affected the efficiency of capital investment. Such a decrease in the efficiency of investment is expected to be more severe at firms which were consistently inefficient prior to 2008. The increase in repurchase activities that I observe in the repurchase tests may be related to how efficiently firms make investment decisions.

In order to examine whether a firm's past investment behavior affects its decision to repurchase cash-settled convertible bonds, I include a measure of past investment efficiency in both Eq. (1) and Eq. (2). This measure is constructed following the methodology in Biddle, Hillary, and Verdi (2009). I estimate a firm-specific model by regressing investment in period t+1 on the sales growth rate in period t. Then I use the residuals as a proxy for investment inefficiency in each year, including both over- and under-investment. In my study, I take the absolute value of the residual terms since both over- and under-investment are considered inefficient. Finally, I construct a variable, *InvEff*, which equals the average of the investment inefficiency measures from the past eight years (2000 to 2007). The results are reported in Panel A of Table 9. The coefficients on *InvEff* are consistently insignificant across all four models. The two "impact" variables, *InterestImpact* and *LevImpact*, and the control variables have the same relations to the likelihood of repurchase as those shown in Table 6. This suggests that past investment efficiency does not affect the results I observe from the repurchase tests in Table 6.

6.2 Quality of Credit Ratings vs. Informativeness of Accounting Ratios

Credit rating agencies became more conservative in assigning ratings to firms after the 2008 financial crisis because of increased scrutiny from legislators and the public. Credit rating agencies were criticized for failing to warn investors about the risk of investing in many subprime securities. The Dodd-Frank Act of 2010 requires that the Federal Reserve Bank and the SEC tighten regulations affecting credit rating agencies. Under the increased monitoring from the government and the public, it is possible that the improvement in the relation between accounting ratios and credit ratings that I observe is simply the result of the increasing conservativeness of credit rating agencies. In order to examine whether the overall quality of credit ratings changes after 2008, I use non-convertible bond issuers as a control group and re-

estimate Eq. (3). The results are presented in Panel B of Table 9. Similar to convertible bond issuers, leverage ratios are significant in the predicted direction in both the pre- and post-2008 periods. Smaller and less profitable firms receive lower ratings than larger and more profitable firms. When comparing the coefficients on all firm characteristics from the pre- and post-2008 periods, it does not seem that the relevance of accounting information and firm characteristics to credit ratings improve in the post-2008 period. This suggests that the results I report in Table 7 are not due to an improvement in credit rating quality, but to the changes in accounting standards.

7. Conclusion

In this study, I empirically test how firms, the credit market, and equity investors responded to the changes of accounting standard in 2008. The FASB released the final version of APB 14-1 in 2008, which requires issuers of cash-settled convertible debt to separately report the debt and equity components. The adoption of APB 14-1 increases both the costs and benefits of using cash-settled convertible debt because the amortization of the equity component increases the interest expense but decreases the leverage ratio. In order to mitigate the negative impact on earnings figures, firms that issued cash-settled convertible debt before 2008 may respond to such changes by cash repurchases of the outstanding amount of such securities. On the other hand, issuers of cash-settled convertible debt may want to keep these securities on their balance sheet so that they can report a lower leverage ratio. This study intends to provide empirical evidence about the economic consequences of APB 14-1.

Using a set of hand-collected data, I form a sample of firms that issued cash-settled convertible debt before the effective date of APB 14-1. First, I find weak evidence that, for 2008, the likelihood of repurchase is greater for cash-settled compared to non-cash-settled convertible

debt. Second, I find that the likelihood of repurchase for cash-settled convertibles is positively associated with the increase in interest expense and negatively associated with the reduction in leverage ratio. The positive (negative) association is the strongest when firms repurchased in 2008. Large and profitable firms are less likely to repurchase because they are more able to bear the cost of increased interest expense resulting from bifurcation. In order to examine whether financially constrained firms act differently from unconstrained ones, I control for the level of firms' financial constraint in the repurchase tests on the samples of both cash-settled convertible issuances and all convertible issuances. I do not find evidence that financial constraint changes the relation between the impact of APB 14-1 and the likelihood of repurchase. I further control for firms' past investment behavior in the repurchase tests, but do not find results that support the argument that firms' decision to repurchase depends on their prior investment efficiency. These results indicate that such repurchases do not depend on whether firms have extra cash on hand or whether they are efficient at capital investment.

One explanation for managers' response to the changes under APB 14-1 is the debt contracting incentives of the sample firms. Firms are more concerned about violating accounting-based debt covenants when mandatory accounting changes are included in the calculation of debt covenant compliance. These results support the debt contracting hypothesis. Firms that use rolling GAAP are more likely to repurchase their outstanding cash-settled convertible bonds when the impact on interest expense is higher, as compared to those that do not use rolling GAAP.

I then examine whether the adoption of APB 14-1 improves the credit rating agencies' assessments of cash-settled convertible debt. I find that the relevance of reported interest coverage ratios to credit ratings increased significantly after the year of the accounting changes.

Before the FASB required the bifurcation of cash-settled convertible debt, financial statement users (e.g., credit rating agencies) adjusted their evaluation of cash-settled convertibles using their own methodologies. However, my results suggest that such adjustments do not contain information that is incrementally relevant over the reported numbers on firms' financial statements. The post-2008 reported interest coverage ratios explain credit ratings better than the pre-2008 adjusted and reported ratios. These comparisons suggest that APB 14-1 improves the information quality disclosed in the financial statements, which helps the credit rating agencies assess the risk of cash-settled convertible debt.

Lastly, shareholders of firms that issued cash-settled convertible bonds react negatively to events that are associated with the development of APB 14-1. The loss of shareholder wealth during the 10 event dates is around 2.1% of firm value, or around $100 million dollars. Furthermore, shareholders of firms that use rolling GAAP in their bank loan agreements react more negatively to the same events. The overall negative impact on shareholder wealth suggests that shareholders consider the changes in the new accounting standard to be costly to their own wealth.

Overall, my study adds to the current accounting literature as to the economic consequences of accounting standard in several ways. First, I show that APB 14-1 had real effects on managerial decisions, namely, on the repurchase of cash-settled convertibles. Second, my results suggest that, for credit analysts, APB 14-1 improves the information content of the financial reporting of cash-settled convertible debt. If the incomplete adjustments that I observe for credit analysts also apply to debt contracts, then APB 14-1 may well have resulted in negative impacts on shareholders. Costly actions were necessary to avoid debt covenant violations.

Future studies could be expanded to investigate the impact of APB 14-1 on bond pricing and the value relevance of earnings. In addition, I can expand my study to examine alternative motives for firms' decisions to repurchase, such as performance-based CEO bonus plans. An expanded sample containing the details of firms' bank loan contracts could also provide more insights into the debt contract hypothesis of managerial response to the new accounting standards.

References

Ashbaugh-Skaife, H., Collins, D. W. and LaFond, R., 2006. The effects of corporate governance on firms' credit ratings. Journal of Accounting and Economics 42 (1-2): 203–243.

Aboody, D., Barth, M. E., and Kasznik, R. 1999. Revaluations of Fixed Assets and Future Firm Performance: Evidence from the U.K. Journal of Accounting and Economics 26: 149-178.

Aboody, D., Barth, M. E., and Kasznik, R. 2004. SFAS No. 123 Stock-Based Compensation Expense and Equity Market Values. The Accounting Review 79(2): 251-275.

Barth, M.E., 1994. Fair value accounting: Evidence from investment securities and the market valuation of banks. The Accounting Review 69: 1-25.

Barth, M. E., Beaver, W. H., and Landsman, W. R., 1996. Value-relevance of banks' fair value disclosures under SFAS 107. The Accounting Review 71: 513–537.

Barth, M. E., Beaver, W. H., and Landsman, W. R., 2001. The relevance of the value-relevance literature for financial accounting standard setting: another view. Journal of Accounting and Economics 31: 77-104.

Barth, M. E., and Clinch, G., 1998. Revalued financial, tangible, and intangible assets: associations with share prices and non market-based value estimates. Journal of Accounting Research 36: 199–233.

Barth, M. E., Landsman, W. R., and Rendleman, Jr., R. J., 1998. Option Pricing-Based Bond Value Estimates and a Fundamental Components Approach to Account for Corporate Debt. The Accounting Review 73(1): 73-102.

Bartov, E., 1997. Foreign currency exposure of multinational firms: Accounting measures and market valuation. Contemporary Accounting Research 14: 623-652.

Beatty, A., Berger, P. G., and Magliolo, J., 1995. Motives for forming research & development financing organizations. Journal of Accounting and Economics 19(2-3): 411-42.

Beatty, A., Ramesh, K., Weber, J., 2002. The importance of excluding accounting changes from the calculation of debt covenant compliance. Journal of Accounting and Economics 33(2):205-227.

Bens, D., Nagar, V., Skinner, D., and Wong, M., 2003. Employee stock options, EPS dilution, and stock repurchases. Journal of Accounting and Economics 36: 51-90.

Bens, D., and Monahan, S., 2008. Altering investment decisions to manage financial reporting outcomes: Asset-backed commercial paper conduits and FIN 46. Journal of Accounting Research 46 (5): 1017–1055.

Bernard, V. L., Merton, R. C., and Palepu, K. G., 1995. Mark-to-market accounting for U.S. banks and thrifts: lessons from the Danish experience. Journal of Accounting Research 33: 1–32.

Biddle, G. C., Hilary, G., and Verdi, R. S., 2009. How Does Financial Reporting Quality Relate to Investment Efficiency? Journal of Accounting and Economics 48.2-3: 112-131.

Black, D. G., 1986. Success and failure of futures contracts: Theory and empirical Evidence. Salomon Brothers Center for the Study of Financial Institutions Monograph Series in Finance and Economics 1986:1.

Bratten, B., Choudhary, P., and Schipper, K., 2013. Evidence that Market Participants Assess Recognized and Disclosed Items Similarly when Reliability is Not an Issue. The Accounting Review 88(4): 1179–1210.

Brennan, M., and Schwartz, E., 1988. The case for convertibles. Journal of Applied Corporate Finance 1: 55-64.

Campbell, J.Y. and Taksler, Glen B., 2003. Equity volatility and corporate bond yields. Journal of Finance 58: 2321-2349.

Campello, M., Graham, J. R., and Harvey, C., 2010. The Real Effects of Financial Constraints: Evidence from a Financial Crisis. Journal of Financial Economics 97: 470-487.

Carrizosa, R., 2010. Market Participants' Evaluation of the Economic Substance of Convertible Debt. Working Paper.

Carter, M.E., Lynch, L.J., 2003. The consequences of the FASB's 1998 proposal on accounting for stock option repricing. Journal of Accounting and Economics 35: 51-72.

Cheng, Q., Frischmann, P., and Warfield, T., 2003. The market perception of corporate claims. Research in Accounting Regulation 16: 3-28.

Choudhary, P., Rajgopal, S., and Venkatachalam, M., 2008. Accelerated vesting of stock options in anticipation of SFAS 123R. Journal of Accounting Research 47 (1): 105–146.

Choudhary, P., 2011. Evidence on differences between recognition and disclosure: A comparison of inputs to estimate fair values of employee stock options. Journal of Accounting and Economics 51(1-2): 77-94.

Christensen, H., Nikolaev, V., 2013. Debt Contracts and the Need for Control over Mandatory GAAP Changes. Working paper.

De Franco, G.,Wong, F., and Zhou, Y., 2011. Accounting adjustments and the valuation of financial statement note information in 10-K filings. The Accounting Review 86 (5):1577–1604.

Demerjian, P., 2011. Accounting standards and debt covenants: Has the "balance sheet approach" led to a decline in the use of balance sheet covenants? Journal of Accounting and Economics 52(2): 178-202.

Dhaliwal, D., Subramanyam, K.R., Trezevant, R., 1999. Is comprehensive income superior to net income as a measure of firm performance? Journal of Accounting & Economics 26: 43-67.

Dukes, R., Dyckman, T., and Elliott, J., 1980. Accounting For Research And Development Costs: The Impact On Research And Development Expenditures. Supplement to the Journal of Accounting Research 18: l-26.

Ederington, L. H., 1985. Classification models and bond ratings. The Financial Review 20 (4): 237 – 262.

Elliott, J., Richardson, G., Dyckman, T.R. and Dukes, R.E., 1984. The impact of SFAS No. 2 on firm expenditures on research and development: replications and extensions. Journal of Accounting Research 22: 85-102.

Finch Ratings. 2011. Treatment and Notching of Hybrids in Nonfinancial Corporate and REIT Credit Analysis.

Graham, J.R., Harvey, C.R., and Rajgopal, S., 2005. The economic implications of corporate financial reporting, Journal of Accounting and Economics 40: 3-73.

Green, R., 1984. Investment incentives, debt, and warrants. Journal of Financial Economics 13: 115-136.

Grinblatt, M. and Longstaff, F. A., 2000. Financial innovation and the role of derivative securities: An empirical analysis of the Treasury STRIPS program. Journal of Finance 55 (3): 1415-1436.

Gomes, A. and Phillips, G., 2004. Why do public firms issue private and public equity, convertibles and debt? Working Paper, University of Pennsylvania

Hand, J., Holthausen, R., and Leftwich, R., 1992. The Effect of Bond Rating Agency Announcements on Bond and Stock Prices. Journal of Finance 47:733-752.

Haugen, R.A., and Senbet, L.W., 1991. Resolving the agency problems of external capital through options, Journal of Finance 36(3): 629-647.

Hausman, J. A., 1978. Specification tests in econometrics. Econometrica 46 (6): 1251–1271.

Hodder, L., W. Mayew, M. McNally, and Weaver, C., 2006. Employee stock option fair-value estimates: Do managerial discretion and incentives explain accuracy? Contemporary Accounting Research 23(4): 933-975.

Holthausen, R. and Leftwich, R., 1986. The effect of bond rating changes on common stock prices. Journal of Financial Economics 17: 57-89.

Holthausen, R. W., and Watts, R. L., 2001. The relevance of the value-relevance literature for financial accounting standard setting. Journal of Accounting and Economics 31: 3-75.

Horowitz, B., and Kolodny. R., 1980. The Economic Effects of Involuntary Uniformity in the Financial Reporting of Research and Development Expenditures. Journal of Accounting Research 18: 38-74.

Imhoff, E., and Thomas, J., 1988. Economic consequences of accounting standards: The lease disclosure rule change. Journal of Accounting and Economics 10: 277–310.

Jensen, M., and Meckling, W., 1976. Theory of the firm: managerial behaviour, agency costs, and ownership structure. Journal of Financial and Economics 3: 305-360.

Kaplan, S.N., and Zingales, L., 1997. Do Investment–Cash Flow Sensitivities Provide Useful Measures of Financial Constraints? Quarterly Journal of Economics 112:159–216.

Kim, D., Palia, D., and Saunders, A., 2003. The long-run behavior of debt and equity underwriting spreads, Working paper, Stern School of Business.

Kimmel, P. and Warfield, T., 1995. The Usefulness of Hybrid Security Classifications: Evidence from Redeemable Preferred Stock. The Accounting Review 70 (1): 151-167.

Kisgen, D., 2006. Credit ratings and Capital Structure. Journal of Finance 61:1035-1072.

Kraft, P., 2012. Rating Agency Adjustments to GAAP Financial Statements and Their Effect on Ratings and Credit Spreads. Working Paper.

Lamont, O., Christopher, P., and Saa-Requejo, J., 2001. Financial constraints and stock Return. Review of Financial Studies 14-2: 529-554.

Leftwich, R., 1983. Accounting information in private markets: Evidence from private lending agreements. The Accounting Review (January): 23-42.

Lewis, C.M., and Verwijmeren, P., 2010. Closing Loopholes in the Accounting of Convertible Debt and the Impact of Call Features. Working Paper.

Lewis, C.M., and Verwijmeren, P., 2011. Convertible security design and contract innovation. Journal of Corporate Finance 17(4): 809-831.

Levi, S., and B. Segal. 2011. The impact of debt–equity reporting classifications on firms' decision to issue hybrid securities. Working paper, INSEAD.

Marquardt, C., and Wiedman, C., 2005. Earnings management through transaction structuring: Contingent convertible debt and diluted EPS. Journal of Accounting Research 43: 205-243.

Marquardt, C., and Wiedman, C., 2007. Economic consequences of regulation of financial reporting: Diluted EPS and contingent convertible securities. Review of Accounting Studies 12: 487-523.

Mayers, D., 1998. Why firms issue convertible bonds: The matching of financial and real investment options. Journal of Financial Economics 47: 83-102.

McConnell, J.J., and Schwartz, E. S., 1992. The origin of LYONS: A case study in financial innovation. Journal of Applied Corporate Finance 4(4): 40-47.

Miller, M. H., 1986. Financial innovation: The last twenty years and the next. Journal of Financial and Quantitative Analysis 21(4): 459-471.

Mittelstaedt, H. F., Nichols, W., and Regier, P., 1995. SFAS No. 106 and benefit reductions in employer-sponsored retiree health care plans. The Accounting Review 70: 535–556.

Moody's. 2010. Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations.

Nelson, K., 1996. Fair Value Accounting for Commercial Banks: An Empirical Analysis of SFAS No. 107. The Accounting Review 71(2): 161-182.

Nini, G., Smith, D. and Sufi, A., 2009. Creditor Control Rights and Firm Investment Policy. Journal of Financial Economics 64(4): 400–420.

Rauh, J.D., and Sufi, A., 2010. Capital Structure and Debt Structure. Review of Financial Study 23(12): 4242-4280.

Schipper, K., Thompson, R., 1983. The impact of merger-related regulations on the shareholders of acquiring firms. Journal of Accounting Research 21: 184-221.

Scott, T.W., Wiedman, C., and Wier, H.A., 2011. Transaction Structuring and Canadian Convertible Debt. Contemporary Accounting Research 28 (3): 1046-1071.

Smith, C.W., and Warner. J. B., 1979. On financial contracting: An analysis of bond covenants. Journal of Financial Economics (June): 117-161.

Standard and Poor's, 2008a. Corporate ratings criteria.

Standard and Poor's, 2008b. Calculating Adjusted Debt and Interest for Corporate Issuers.

Stein, J., 1992. Convertible bonds as backdoor equity financing. Journal of Financial Economics 32: 3-21.

Tufano, P., 2003. Financial innovation. In Constantinides, G.M., Harris, M., and Stulz, R.M. (eds.), Handbook of the Economics of Finance. Elsevier, Amsterdam, 307-335.

Vuong, Q.H., 1989. Likelihood ratio tests for model selection and non-nested hypotheses. Econometrica 57(2): 307-333.

Watts, R., and Zimmerman J.L., 1986. Positive Accounting Theory. Prentice Hall.

Watts, R., and Zimmerman. J.L., 1990. Positive Accounting theory: A ten Year Perspective. The Accounting Review (65): 131-156.

APPENDIX A

Adjustment Methodology under APB 14-1

How to reliably estimate the value of each component of convertible debt is not a straightforward process. Barth, Landsman, and Rendleman (1998) estimate the fair value of convertible debt using option-based pricing model. They find that estimated values of convertible debt components vary significantly across estimation order. "Each component's incremental contribution to total bond value depends on which components are before it" in the estimation process. Arbitrary assignment of different feature's value is necessary in order for the sum of component values equal to the total bond value. In contrast, Bratten, Choudhary, and Schipper (2013) provide evidence that the "as-if recognized" values of capital lease calculated using a simple present value technique are generally reliable. However, the implied interest rate used to calculate the imputed lease values may not be the same as the one used by the financial statement users.

Under APB 14-1, the issuer of a cash-settled convertible debt instrument shall "first determine the carrying amount of the liability component by measuring the fair value of a similar liability (including any embedded features other than the conversion option) that does not have an associated equity component." The excess of the principal amount of the liability component over its carrying amount, which is called debt discount, shall be amortized to interest cost using the interest method. The debt discounts and debt issuance costs shall be amortized over the expected life of a similar liability that does not have an associated equity component.

The reliability of estimated carrying value of liability component depends on both objective factors (e.g., bond maturity and coupon rate) and subjective factors (e.g., discount rate). The challenge in this process is to choose the appropriate discount rate and calculate amortization of debt discount under interest method. The selection of a discount rate may be affected by many considerations. For example, the choice of a rate may be affected by the approximation of the prevailing market rates for a comparable debt security, and the current rates for debt securities with substantially identical terms and risks that are traded in open markets.

Under APB 14-1, firms are required to disclose the discount rate on the liability component and the amortized amount of debt discount, besides other related information.

Therefore, I first estimate debt discount using discount rates provided by firms. If such information is missing, I then use the coupon rate of straight debt with similar terms that is issued by firms with similar credit ratings during the same year. Lastly, for firms that do not have either rate discussed above, I resort to coupon rates of other straight debt issued with the same terms in the same year as convertible debt. I calculate the value-weighted average of these rates. After these three steps, I am able to identify the discount rates for all 359 cash-settled convertible debt issues.

APPENDIX B

Example of Impact of Bifurcation under APB 14-1

Example 1. On January 1, 2007, Company A issues 100,000 convertible notes at their par value of $1,000 per note, raising total proceeds of $100,000,000. The notes bear interest at a fixed rate of 2 percent per annum, payable annually in arrears on December 31, and are scheduled to mature on December 31, 2016. Each $1,000 par value note is convertible at any time into the equivalent of 10 shares of Company A's common stock (that is, representing a stated conversion price of $100 per share). The quoted market price of Company A's common stock is $70 per share on the date of issuance. Its average stock price is $110 per share in 2007. Upon conversion, *Company A elects to settle the principal amount of the debt in cash and the conversion spread in common stock.* The notes do not contain embedded prepayment features other than the conversion option. At issuance, the market interest rate for similar debt without a conversion option is 8 percent. Company A's tax rate is 40 percent.

During year 2007, Company A reports net income of $10,000,000 and 20,000,000 weighted average shares outstanding for the accounting period.

In the pre-APB 14-1 era, under APB 14, Company A records total proceeds of $100,000,000 as liability in 2007. The annual interest expense is $ 2,000,000. The total reported interest expense over the 10-year life is $ 20,000,000. The FASB amended EITF 90-19 in January 2002 to allow for the exclusion of non-cash settled portion of such convertible debt (in this example, it is the principal amount that is settled in cash) from diluted EPS calculation.

Total liability component: $100,000,000

Total equity component: $0

Reported net income: $10,000,000

Annual interest expense: $ 2,000,000

Total interest expense over 10-year life: $ 20,000,000

The basic EPS: 0.5

Adjustment to the numerator: $0

Adjustment to the denominator: 90,909 shares.[26]

Diluted EPS: 0.497.[27]

Example 2. On January 1, 2009, Company A issued convertible bonds with the same terms as in Example 1.

In the post-APB 14-1 period, the fair value of the liability component can be estimated by calculating the present value of its cash flows using a discount rate of 8 percent, the market rate for similar notes that have no conversion rights, as shown below:

Present value of the principal—$100,000,000 payable in 10 years 8% market rate	$ 46,319,349
Present value of interest—$2,000,000 payable annually in arrears for 10 years	$ 13,420,163
Total liability component	$ 59,739,512
Total equity component/debt discount ($100,000,000 – $59,739,512)	$ 40,260,488

Each year, Company A reports interest expense of $ 2,000,000 plus the amortized amount of the total debt discount. For example, at the end of 2009, Company A's reported interest expense is $ 4,779,161, which is the sum of $ 2,000,000 coupon interest plus $ 2,779,161 debt discount.[28] In this case, *ceteris paribus*, the net income is decreased by $ 2,779,161 and becomes $ 7,220,839 for year 2009.

Now let's look at the impact on EPS. During year 2009, Company A reports net income of $7,220,839 and 20,000,000 weighted average shares outstanding for the accounting period. According to paragraph 29 of Statement 128 amended in 2008, the cash-settled portion of this convertible debt (the principal amount that is paid by cash at settlement) is excluded from the fully diluted EPS calculation. Only the conversion spread that is settled in common stock should be converted into additional shares to be issued based upon average stock price during the year and included in fully diluted EPS calculation (see the provisions of paragraph 29 of Statement 128).

Total liability component: $ 59,739,512

[26] The conversion spread at the end of 2007: $110 x 1,000,000 shares – $100,000,000 = $10,000,000. The additional shares that will be issued at the conversion date: $10,000,000 ÷ $110 = 90,909 shares.

[27] $10,000,000 ÷ (20,000,000 + 90,909) = 0.497.

[28] The debt discount for 2009 is calculated with interest method: 8% x 59,739,512 – 2% x $100,000,000 = $2,779,161.

Total equity component: $ 40,260,488.

Reported net income: $ 7,220,839

Interest expense for 2009: $ 4,779,161

Total interest expense over 10-year life: $ 40,260,488

The basic EPS: 0.361

Adjustment to the numerator: $0.

Adjustment to the denominator: 90,909 shares.[29]

Diluted EPS: 0.359 [30]

Summary of Impact of APB 14-1:

	Pre- APB 14-1: Example 1 (Jan. 1, 2007)	Post-APB 14-1: Example 2 (Jan. 1, 2009)	Impact of APB 14-1 on the same convertible debt if issued in 2007 vs. 2009	
	(1)	(2)	((2)-(1))	((2)-(1)) ÷ (1)
Total liability component	$100,000,000	$59,739,512	($40,260,488)	-40.26%
Total equity component	$0	$40,260,488	$40,260,488	100.00%
Reported net income	$10,000,000	$7,220,839	($2,779,161)	-27.79%
Interest expense for 2009	$2,000,000	$4,779,161	$2,779,161	138.96%
Total interest expense over 10-year life	$20,000,000	$40,260,488	$20,260,488	101.30%
The basic EPS	0.5	0.361	(0.139)	-27.80%
Adjustment to the numerator	$0	$0	$0	0.00%
Adjustment to the denominator	90,909 shares	90,909 shares	90,909 shares	0%
Diluted EPS	0.497	0.359	(0.138)	-27.76%

[29] The conversion spread at the end of 2009: $110 x 1,000,000 shares – $100,000,000 = $10,000,000. The additional shares that will be issued at the conversion date: $10,000,000 ÷ $110 = 90,909 shares.

[30] $7,220,839 ÷ (20,000,000 + 90,909) = 0.359.

APPENDIX C

Credit Rating Agencies Adjustments for Convertible Debt

	Moody's	Standard & Poor's	Fitch Ratings
Adjustment to Debt/Equity Ratio	Subjective weights are assigned to debt and equity components of a convertible debt as if it lies on a continuum. Five categories of weights are used to separate debt and equity components: 100% debt and 0% equity, 75% debt and 25% equity, 50% debt and 50% equity, 25% debt and 75% equity, and 0% debt and 100%.	Starting in 2008, amortized cost method is used to reflect the value of debt component of a convertible bond. The amortized cost method captures the amount to be paid at maturity, discounted at the rate agreed on issuance.	Convertible debt is allocated into three categories: 100% equity, 50% equity and 50% debt, or 100% debt. This is a rough and qualitative approximation.
Adjustment to Coverage Ratio	Reported interest expense is adjusted to dividends for the calculated equity portion of convertible debt based upon hybrid basket treatment.	Under the amortized cost method, reported interest expense is adjusted, where applicable, to reflect the full borrowing cost.	Fitch uses the face value of convertible debt to calculate interest coverage ratios. Thus, Fitch does not make any adjustment to coverage ratios to reflect the separation of debt and equity components.

APPENDIX D

Variable Definitions

Variable		Description
adjInterestCov	=	Reported interest coverage ratio adjusted for the increase in interest expense resulting from bifurcation requirement before the adoption of APB 14-1.
adjLev	=	Reported leverage ratio adjusted for the reduction of total debt resulting from bifurcation requirement before the adoption of APB 14-1.
CAP_Inten	=	Gross PPE ÷ total assets. It measures issuers' tangible assets intensity.
CAPX	=	Capital expenditure ÷ total assets.
CashSettle	=	Indicator variable that equals one if convertible debt securities contain cash settlement feature, zero otherwise.
Cash	=	Cash on hand ÷ total assets
CashFlow	=	Cash flow from operation÷ total assets
EarlyRedeem	=	Indicator variable that equals one if issuer has an option to redeem outstanding convertibles prior to maturity date, zero otherwise.
EPS_dilution	=	Compustat diluted EPS for the fiscal year minus the comparable diluted EPS figure assuming all outstanding cash-settled convertible bonds were included in the diluted EPS, scaled by share prices.
rankFinConst	=	The tertile ranking of financial constraint measure calculated using the methodology from Lamont, Polk, and Saa-Requejo (2001). The higher the ranking, the more constrained a firm is.
InterestImpact	=	For 2008, this is the change in reported interest expense as a result of bifurcation, scaled by the issuers' EBIT in 2008. For 2009, a similar calculation is made. Thus, this variable measures the impact of increased interest expense on issuers' EBIT due to the bifurcation required by APB14-1.
InstOwn	=	% of shares held by institutional investors.
InterestCoverage	=	Issuers' EBIT ÷ Issuers' interest expense.
InvEff	=	Average of past eight years' investment efficiency measures (2000-2007)

		calculated following Biddle, Hilary, and Verdi (2009).
Lev_MV	=	Book value of total liabilities ÷ (Book value of total liabilities + market value of equity).
Lev	=	Book value of total liabilities ÷ (Book value of total liabilities + book value of equity).
LevImpact	=	For 2008, this is the change in reported leverage as a result of bifurcation. For 2009, a similar calculation is made. Thus, this variable measures the impact of bifurcation on leverage ratio.
Loss	=	Indicator variable that equals one if the issuers' EBIT is negative in the current and previous years, zero otherwise.
Proceeds	=	Proceeds received from the issuance of convertible debt.
Public	=	Indicator variable that equals one if the issuance is public, zero otherwise.
Repurchase	=	Indicator variable that equals one if the issuer of convertible debt repurchased any amount of its outstanding convertible debt in 2008 or 2009, zero otherwise.
ROA	=	Issuer's EBIT ÷ average total assets.
Size	=	The log of total assets at the end of each fiscal year.
Debt Covenant Variables		
AddtlDebtIssueCovenant	=	Indicator variable that equals one if a public debt contract contains a debt issuance covenant, zero otherwise.
CoverageCovenant	=	Indicator variable that equals one if a public debt contract contains an interest expense or fixed charge covenant, zero otherwise.
Rolling GAAP	=	Indicator variable that equals one if mandatory changes in accounting standards are included in the calculation of debt covenant compliance, zero otherwise.
Frozen GAAP	=	Indicator variable that equals one if mandatory changes in accounting standards are excluded in the calculation of debt covenant compliance, zero otherwise.

APPENDIX E

Examples of Contracting Treatment of GAAP Changes

1. Rolling GAAP

All accounting terms not specifically or completely defined herein shall be construed in conformity with, and all financial data (including financial ratios and other financial calculations) required to be submitted pursuant to this Agreement shall be prepared in conformity with, GAAP applied on a consistent basis, as in effect from time to time.

2. Rolling GAAP for voluntary accounting changes

If GAAP shall change from the basis used in preparing such financial statements, the certificates required to be delivered pursuant to subsection 10.2 demonstrating compliance with the covenants contained herein shall set forth calculations setting forth the adjustments necessary to demonstrate how the Company is in compliance with the financial covenants based upon GAAP as in effect on the Closing Date.

3. Frozen GAAP

All accounting terms not specifically defined herein shall be construed in accordance with generally accepted accounting principles consistent with those applied in the preparation of the financial statements referred to in Section 4.01.

4. Frozen GAAP on request

If at any time any change in GAAP would affect the computation of any financial ratio or requirement set forth in any Loan Document, and either the Borrower or the Required Lenders shall so request, the Administrative Agent, the Lenders and the Borrower shall negotiate in good faith to amend such ratio or requirement to preserve the original intent thereof in light of such change in GAAP (subject to the approval of the Required Lenders (such approval not to be unreasonably withheld, delayed or conditioned).

TABLE 1

Sample Selection and Industry Distribution

Panel A: Sample selection

	Issuances	Firms
Number of convertible debt issuances 2005-2011	626	478
Less: Firms from financial and utilities industries	-115	-79
Total number of unique observations	511	390
Less: Firms missing Compustat data	-34	-30
Final Sample	477	360
Including: Cash-Settled convertible debt	359	279

Panel B: Distribution of cash-settled convertible debt issuers by industries

Industry	# of Issuances	% of Sample	# of Issuers	% of Sample
Business Services	45	12.53	32	11.47
Chemicals&Allied Products	52	14.48	40	14.34
Coal	7	1.95	5	1.79
Communication	20	5.57	14	5.02
Electronic & other Electrical Equipment	49	13.65	27	9.68
Engineering & Accounting & Mgmt Services	4	1.11	3	1.08
Fabricated Products	9	2.51	8	2.87
Food Products	5	1.39	5	1.79
Food Stores	2	0.56	2	0.72
Healthcare	10	2.79	8	2.87
Industrial & Commercial Machinery	20	5.57	17	6.09
Measuring and Control Equipment	34	9.47	27	9.68
Metal Mining	8	2.23	5	1.79
Oil & Gas Extraction	20	5.57	15	5.38
Primary Metal Industries	7	1.95	6	2.15
Transportation by Air	8	2.23	7	2.51
Transportation Equipment	12	3.34	10	3.58
Wholesale Trade-Durable Goods	11	3.06	8	2.87
All Others	36	10.03	40	14.34
Total	359	100	279	100

Panel A shows the sample selection process for the 477 new convertible debt issues from 360 U.S. public firms during sample period. Panel B reports the industry distribution of the cash-settled convertible debt issuances. Industry classifications are based upon two-digit Compustat SIC codes.

TABLE 2

Summary of New Debt Issuances (2005-2011)

Issue Year	Cash-Settled Convertible Debt		Sum of Cash- and Equity-Settled Convertible Debt		Proportion of Cash-Settled to Sum of Cash- and Equity-Settled Convertible Debt		Straight Debt	
	Total Proceeds ($billions)	No. of Issuance	Total Proceeds ($billions)	No. of Issuance	Total Proceeds (%)	No. of Issuance (%)	Total Proceeds ($billions)	Proportion of Cash-Settled to Straight Debt (%)
2005	15.10	49	16.04	56	94.17	87.50	163.61	9.23
2006	46.25	78	47.54	88	97.28	88.64	233.83	19.78
2007	41.32	94	48.08	116	85.95	81.03	260.67	15.85
2008	13.78	39	16.39	53	84.07	73.58	206.72	6.66
2009	17.09	43	24.65	84	69.32	51.19	330.33	5.17
2010	12.65	34	16.70	60	75.77	56.67	218.15	5.80
2011	10.44	35	13.65	54	76.49	64.81	229.50	4.55
Total	156.63	372	183.04	511	85.57	72.80	1,642.82	9.53

This table reports the total proceeds received from new issues of cash-settled convertible debt, sum of cash- and equity-settled convertible debt, and straight debt by the U.S. public firms during the sample period. Data source: Securities Data Company (SDC).

TABLE 3

Descriptive Statistics

Panel A: Characteristics of convertible debt issuances

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
Indicator Variables								
CashSettle	511	0.73	0.45					
StockRepurchase	511	0.18	0.38					
Repurchase	511	0.42	0.49					
EarlyRedeem	511	0.44	0.50					
Public	511	0.34	0.47					
Characteristics of Issuances								
Proceeds ($ millions)	511	358.19	483.78	0.25	121.00	215.50	396.00	4950.00
CouponRate (%)	511	3.75	2.39	0.00	2.25	3.25	4.63	18.00
BondMaturity	511	11.31	8.90	1.00	5.00	7.00	20.00	50.00
RestrictPeriod	511	7.15	5.96	0.00	5.00	5.10	7.10	40.60

Panel B: Univariate analyses for new convertible issuances in pre-2008 and post-2008

	Post-2008			Pre-2008			Mean Values		Median Values	
Variable	N	Mean	Median	N	Mean	Median	Diff.	*t*-statistics	Diff.	*z*-statistics
Indicator Variables										
CashSettle	198	0.56	1	313	0.83	1	-0.27	-6.84***	0	-6.55***
StockRepurchase	198	0.11	0	313	0.22	0	-0.11	-3.17***	0	-3.14***
Repurchase	198	0.19	0	313	0.57	1	-0.38	-8.88***	-1	-8.27***
EarlyRedeem	198	0.26	0	313	0.56	1	-0.30	-7.06***	-1	-6.75***
Public	198	0.44	0	313	0.28	0	0.16	3.91***	0	3.86***

TABLE 3 (continued)

Characteristics of Issuances										
Proceeds ($millions)	198	277.76	196	313	409.07	230	-131.31	-3.01***	-34	-3.20***
CouponRate (%)	198	4.73	4	313	3.12	2.88	1.61	7.86***	1.12	7.92***
BondMaturity	198	7.32	5	313	13.84	8	-6.52	-8.63***	-3	-9.43***
RestrictPeriod	198	5.13	5	313	8.43	6.20	-3.30	-6.34***	-1.20	-7.17***

Panel C: Firm characteristics – Issuers of both cash-settled and non-cash-settled convertible bonds

	2009			2010		
Variable	**N**	**Mean**	**Median**	**N**	**Mean**	**Median**
InterestImpact (%)	225	0.08	0.03	217	0.08	0.02
InterestImpact($million)	225	5.72	3.39	218	5.70	3.27
LevImpact	225	0.05	0.03	218	0.05	0.03
Size (logTotalAssets)	225	7.39	7.33	218	7.46	7.45
BM	225	0.53	0.49	218	0.48	0.45
CashFlow	225	0.03	0.05	217	0.02	0.05
Cash	223	0.15	0.10	216	0.15	0.11
CAPX($million)	225	243.46	46.40	217	241.35	51.21
ROA	225	0.02	0.05	217	0.04	0.07
Loss	225	0.41	0.00	218	0.28	0.00
InterestCoverage	220	2.75	2.04	213	9.40	3.18
Lev_MV	225	0.45	0.42	218	0.41	0.39
Lev	225	0.63	0.57	218	0.62	0.56
rankFinConst	221	1.98	2.00	211	1.93	2.00
InstOwn	225	0.84	0.91	218	0.82	0.87
EPS_dilution	225	0.00	0.00	218	0.00	0.00

Panel D: Firm characteristics – Issuers of cash-settled convertible bonds

	2009			2010		
Variable	**N**	**Mean**	**Median**	**N**	**Mean**	**Median**
InterestImpact (%)	220	0.08	0.03	212	0.07	0.02
InterestImpact($million)	220	7.20	3.88	212	7.34	3.98
LevImpact	220	0.05	0.03	212	0.05	0.02
Size (logTotalAssets)	220	7.65	7.53	212	7.75	7.67
BM	220	0.55	0.49	212	0.50	0.46
CashFlow	220	0.04	0.06	212	0.03	0.05
Cash	218	0.14	0.09	209	0.13	0.10
CAPX ($million)	220	330.78	52.36	212	328.08	65.26
ROA	220	0.04	0.06	212	0.06	0.08
Lev_MV	220	0.44	0.41	212	0.41	0.39
Lev	220	0.61	0.57	212	0.60	0.54
rankFinConst	217	1.8	2	206	1.89	2.00
Public	220	0.25	0.00	212	0.26	0.00
EPS_dilution	220	0.00	0.00	212	0.00	0.00

Panel E: Descriptive statistics for variables in credit rating tests

	Post2008			Pre2008		
Variable	**N**	**Mean**	**Median**	**N**	**Mean**	**Median**
Ratings	360	2.89	3.00	265	2.94	3.00
Lev_MV	360	0.51	0.49	265	0.49	0.48
InterestCoverage	360	5.81	2.75	265	13.09	3.72
Size	360	8.38	8.24	265	8.20	8.05
Loss	360	0.28	0.00	265	0.30	0.00
CAP_Inten	357	0.60	0.50	263	0.51	0.34
InstOwn	360	0.85	0.89	265	0.89	0.95

This table provides descriptive statistics about the new issuances of convertible debt and the issuing firms during repurchase years. Panel A reports the summary statistics for 511 new issuances by 390 U.S. public firms from 2005 to 2011. Panel B reports univariate analyses for the new issuances before and after the adoption of APB 14-1 at the end of 2008. Panel C reports firm characteristics of all convertible bond issuers in my sample in the years of 2009 and 2010. Panel D reports firm characteristics of cash-settled convertible bonds in the years of 2009 and 2010. Panel E reports descriptive statistics for variables used in the credit rating tests. Variables are defined in the appendix D.

TABLE 4

Repurchase Activities

	Year of repurchase initiation							
Issue year	2005	2006	2007	2008	2009	2010	2011	Total
2005	1	3	1	4	7	2	1	19
2006		0	1	9	13	8	8	39
2007			0	16	16	4	9	45
Sub-Total	1	3	2	29	36	14	18	103
2008				3	3	5	5	16
2009					1	2	4	7
2010						0	2	2
2011							0	0
Sub-Total	0	0	0	3	4	7	11	25

This table presents the number of firms that repurchased their outstanding cash-settled convertible debt during the sample period. Numbers in this table represent the unique firms that initiated the repurchases in a given year. If a firm repurchased in multiple years, it is included only in the year it first started.

TABLE 5

Debt Contracting Practice

Panel A: Public straight debt

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
CoverageCovenant	215	0.10	0.30	0	0	0	0	1
AddtlDebtIssueCovenant	215	0.28	0.45	0	0	0	1	1

Panel B: Bank loan agreements – Issuers of all convertible bonds

RollingGAAP	105	0.33	0.47	0	0	0	1	1
RollingGAAP_Voluntary	105	0.05	0.21	0	0	0	0	1
FrozenGAAP	105	0.10	0.31	0	0	0	0	1
FrozenGAAPonRequest	105	0.51	0.50	0	0	1	1	1

Panel C: Bank loan agreements – Issuers of cash-settled convertible bonds

RollingGAAP	84	0.32	0.47	0	0	0	1	1
RollingGAAP_Voluntary	84	0.04	0.19	0	0	0	0	1
FrozenGAAP	84	0.12	0.33	0	0	0	0	1
FrozenGAAPonRequest	84	0.52	0.50	0	0	1	1	1

This table reports the debt contracting practices for 215 sample firms that are matched with the Mergent FISD public debt database and 105 sample firms that are matched with the Nini, Smith, and Sufi (2009) credit agreements database. Of the 105 sample firms that have bank loan agreements data, 84 firms issued cash-settled convertible bonds during sample period. Panel A reports debt covenant details for public straight debt bonds issued by the sample firms. Panel B reports debt covenant details for bank loan agreements for issuers of all convertible bonds. Panel C reports debt covenant details for bank loan agreements for issuers of cash-settled convertible bonds. Variables are defined in the appendix D. Examples of contracting treatment of GAAP changes are provided in appendix E.

TABLE 6

Decisions to Repurchase Cash-settled Convertibles

This table reports the analyses of the convertible debt issuers' decision to repurchase part or all of their outstanding cash-settled convertibles starting in fiscal year 2008. I perform the following probit estimations at issuance-year level for 2008 and 2009:

$$Pr(Repurchase)_{it} = \gamma_0 + \gamma_1 CashSettle_t + \gamma_2 InterestCoverage_{it+1} + \gamma_3 Lev_{it+1} + \gamma_4 EPS\_dilution_{it+1} + \gamma_5 EarlyRedeem_{it} + \gamma_6 Size_{it+1} + \gamma_7 ROA_{it+1} + \gamma_8 Cash_{it+1} + \gamma_9 CAPX_{it+1} + \gamma_{10} Public_{it} + \varepsilon_1 \quad (1)$$

$$Pr(Repurchase)_{it} = \gamma_0 + \gamma_1 InterestImpact_{it+1} + \gamma_2 LevImpact_{it+1} + \gamma_3 EPS\_dilution_{it+1} + \gamma_4 EarlyRedeem_{it} + \gamma_5 Size_{it+1} + \gamma_6 ROA_{it+1} + \gamma_7 Cash_{it+1} + \gamma_8 CAPX_{it+1} + \gamma_9 Public_{it} + \varepsilon_2 \quad (2)$$

Industry fixed effects are included for each model but not tabulated. I estimate each of the models cross-sectionally for each year and cluster the standard errors at the firm level. The number of observations for each column equals to the difference between the total number of cash-settled convertible bonds (all convertible bonds) outstanding at the end of 2008 (see Panels C and D of Table 3) and the number of observations dropped in the estimation process due to the industry fixed effect. Coefficient *t*-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% (one-sided for variables with prediction, two-sided for others) levels, respectively. Variables are defined in the appendix D.

Dependent variable = $Pr(Repurchase)_{it}$		Cash-Settled Sample				All Convertible Sample	
Variable	Predicted Sign	t=2008		t=2009		t=2008	t=2009
		1	2	3	4	5	6
$CashSettle_t$	+					0.554*	-0.081
						(1.47)	(-0.29)
$InterestImpact_{it+1}$	+	1.824**	1.805**	1.620**	1.592**		
		(2.25)	(2.26)	(2.12)	(2.06)		
$LevImpact_{it+1}$	−	-9.598***	-9.281***	-9.301***	-8.732***		
		(-2.94)	(-2.77)	(-2.84)	(-2.68)		
$rankFinConst_{t+1}$			0.060		0.185		
			(0.22)		(0.81)		
$EPS\_dilution_{it+1}$		48.678*	49.045*	-8.768	-10.410		
		(1.67)	(1.65)	(-0.29)	(-0.33)		
$EarlyRedeem_{it}$		0.133	0.132	0.376	0.355	-0.093	0.297
		(0.41)	(0.41)	(1.33)	(1.24)	(-0.33)	(1.22)
$Size_{it+1}$		-0.466***	-0.455**	-0.433***	-0.395**	-0.285**	-0.279**
		(-2.67)	(-2.19)	(-2.75)	(-2.24)	(-2.02)	(-2.14)
ROA_{it+1}		-2.980***	-2.859**	1.067	1.484	-0.981	1.316
		(-2.68)	(-2.56)	(0.91)	(1.24)	(-1.15)	(1.56)

TABLE 6 (continued)

$Cash_{it+1}$	-0.018	-0.070	0.009	0.039	0.145	0.091
	(-0.01)	(-0.05)	(0.01)	(0.04)	(0.16)	(0.12)
Lev_{it+1}					-0.435	-0.410
					(-0.83)	(-0.80)
$InterestCoverage_{it+1}$					-0.006	0.001
					(-0.61)	(0.27)
$CAPX_{it+1}$	0.001***	0.001***	-0.001	-0.001	0.001***	-0.001
	(3.70)	(3.56)	(-1.33)	(-1.33)	(4.17)	(-1.49)
$Public_{it}$	-0.186	-0.177	-0.087	-0.115	-0.245	-0.265
	(-0.56)	(-0.51)	(-0.31)	(-0.38)	(-0.91)	(-1.09)
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	155	154	171	169	197	208
Pseudo-R^2	0.347	0.348	0.238	0.238	0.199	0.189

TABLE 7

Credit Ratings Tests

This table reports the analyses of the determinants of credit ratings prior to APB 14-1. I estimate the following ordered logit model at firm-year level for both before and after 2008 periods:

$$CreditRating_{it} = \delta_0 + \delta_1 InterestCoverage_{it} + \delta_2 Lev_{it} + \delta_3 Size_{it} + \delta_4 Loss_{it} + \delta_5 CAP\_Inten_{it} + \delta_6 InstOwn_{it} + \varepsilon_3 \quad (3)$$

Industry and year fixed effects are included for each model but not tabulated. I estimate the model cross-sectionally. Descriptive statistics for the variables are provided Panel E of Table 3. Coefficient *t*-statistics are in parentheses. ∗∗∗, ∗∗, and ∗ denote significance at the 1%, 5%, and 10% (one-sided for variables with prediction, two-sided for others) levels, respectively. Standard errors are clustered by firm. Variables are defined in the appendix D.

		Pre-2008		**Post-2008**
Ordered logit model:		1	2	3
Variables	Predict Signs	**β_1** **(** Reported)	**β_1'** **(**Adjusted)	**β_1''** **(** Reported)
InterestCoverage	+	0.002		0.057***
		(0.67)		(2.66)
adjInterestCov	+		0.005	
			(0.85)	
Lev_MV	−	-7.261***		-9.526***
		(-4.01)		(-3.51)
adjLev_MV	−		-7.029***	
			(-4.15)	
Size		1.730***	1.797***	1.718***
		(6.32)	(6.33)	(4.54)
Loss		-1.500***	-1.577***	-0.160
		(-2.91)	(-3.07)	(-0.25)
CAP_Inten		-0.773	-0.776	1.702
		(-0.83)	(-0.84)	(1.46)
InstOwn		-1.178	-1.270	-2.000
		(-0.77)	(-0.82)	(-0.67)
Industry fixed effect		Yes	Yes	Yes
Year fixed effect		Yes	Yes	Yes
Observations		263	263	357
Pseudo-R^2		0.434	0.435	0.566

F-tests:
pre-2008 adjusted ratios = pre-2008 reported ratios:

	Diff.	*p*-value
Interest Coverage:	0.003	0.21
Leverage:	-0.232	0.57

TABLE 7 (continued)

post-2008 reported ratios = pre-2008 reported ratios:			
	Interest Coverage:	**0.055**	**0.02**
	Leverage:	2.265	0.70
post-2008 reported ratios = pre-2008 adjusted ratios:			
	Interest Coverage:	**0.052**	**0.04**
	Leverage:	2.497	0.80

TABLE 8

Shareholder Wealth Effects Tests

Panel A: Event dates

Event #	Event date	Description	Expected shareholder reaction
1	01/29/2007	FASB added EITF 07-2 to the agenda with the intent to revise the guidance in Issuer 90-19 about cash-settled convertible debt.	–
2	02/28/2007	FASB issued the summary of EITF 07-2.	–
3	06/14/2007	EITF 07-2 is removed from the EITF's agenda because the Task Force meeting failed to come to consensus about this issue.	+
4	07/15/2007	FASB directs staff to draft a proposed FSP on cash-settled convertible debt.	–
5	08/31/2007	FASB released proposed draft of APB 14-1	–

Panel B: Mean excess returns around event dates – Issuers of cash-settled convertibles

		Abnormal Returns (0,1)
No. of firms:		Cash-Settled Sample N=145
	Predicted Sign	
Event 1: 1/29/2007	–	0.0003
		(0.14)
Event 2: 2/28/2007	–	-0.0033***
		(7.65)
Event 3: 6/14/2007	+	0.0026*
		(1.62)
Event 4: 7/15/2007	–	-0.0040***
		(4.75)
Event 5: 8/31/2007	–	-0.0008
		(0.33)
All five events	–	-0.0021**
		(2.18)

Panel C: Mean excess returns around event dates – Rolling GAAP firms vs. Non-rolling GAAP firms

		Abnormal Returns (0,1)	
		Rolling GAAP	Non-Rolling GAAP
No. of firms:		N=7	N=35
	Predicted Sign		
Event 1: 1/29/2007	−	-0.002	0.0026***
		(0.53)	(4.28)
Event 2: 2/28/2007	−	0.0012**	-0.0026**
		(2.22)	(2.54)
Event 3: 6/14/2007	+	0.0116***	0.0030**
		(15.56)	(2.09)
Event 4: 7/15/2007	−	-0.0013	-0.0041***
		(0.76)	(8.82)
Event 5: 8/31/2007	−	-0.0000	-0.0020
		(0.02)	(1.37)
All five events	−	-0.0027* (1)	-0.0018** (2)
		(1.57)	(2.10)
		Diff.	*z*-statistic
F-test: (1) = (2)		-0.0009	12.87

This table reports the impact of APB 14-1 on shareholder wealth effects. Panel A presents a list of key event dates that are related to the development of the final APB 14-1. The dates are collected from www.fasb.org. Panel B documents the mean excess returns at issuers of cash-settled convertible bonds around the five event dates in Panel A. Total number of issuers that had outstanding cash-settled convertible bonds on the first event date is 145 (out of 279 issuers). Panel C compares the mean excess returns at cash-settled convertible bond issuers that use rolling GAAP and those that do not use rolling GAAP in the bank loan agreements. Of 27 cash-settled convertible issuers that use rolling GAAP (Panel C of Table 5), 7 firms had cash-settled convertible bonds outstanding on the first event date. Of 57 cash-settled convertible issuers that do not use rolling GAAP (Panel C of Table 5), 35 firms had cash-settled convertible bonds outstanding on the first event date. *T*-statistics based upon robust standard errors are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels (one-sided), respectively.

TABLE 9

Robustness Tests and Sensitivity Analyses

Panel A: Investment efficiency and repurchase

Dependent variable = *Pr(Repurchase)*$_{it}$		**Cash-Settled Sample**		**All Convertible Sample**	
Variable	Predicted Sign	t=2008	t=2009	t=2008	t=2009
		1	2	3	4
CashSettle$_{t}$	+			0.557*	-0.065
				(1.51)	(-0.24)
InterestImpact$_{it+1}$	+	1.702**	1.679**		
		(2.18)	(2.15)		
LevImpact$_{it+1}$	−	-9.495***	-9.796***		
		(-2.99)	(-3.07)		
InvEff$_{t+1}$		0.464	1.807	-0.778	-2.289
		(0.14)	(0.76)	(-0.31)	(-1.15)
EPS_dilution$_{it+1}$		37.502	-18.446		
		(1.19)	(-0.63)		
EarlyRedeem$_{it}$		0.181	0.403	-0.061	0.328
		(0.55)	(1.46)	(-0.21)	(1.33)
Size$_{it+1}$		-0.488***	-0.454***	-0.281**	-0.273**
		(-2.89)	(-2.85)	(-1.98)	(-2.10)
ROA$_{it+1}$		-2.556**	1.211	-1.460	1.138
		(-2.39)	(1.03)	(-1.46)	(1.29)
Cash$_{it+1}$		0.041	-0.022	0.277	0.074
		(0.03)	(-0.02)	(0.28)	(0.10)
Lev$_{it+1}$				-0.540	-0.363
				(-0.91)	(-0.69)
InterestCoverage$_{it+1}$				0.004	0.000
				(0.34)	(0.20)
CAPX$_{it+1}$		0.001***	-0.001	0.001***	-0.001
		(4.51)	(-1.17)	(4.76)	(-1.56)
Public$_{it}$		-0.232	-0.095	-0.230	-0.245
		(-0.68)	(-0.34)	(-0.83)	(-1.00)
Industry fixed effect		Yes	Yes	Yes	Yes
Observations		148	164	183	202
Pseudo-R^2		0.373	0.239	0.229	0.187

Panel B: Credit rating test within straight debt issuers

Dependent variable=Ratings				
Variables	Predict Signs	**Pre-2008**	**Post-2008**	
InterestCoverage	+	-0.002	0.012	
		(-0.80)	(0.85)	
Lev_MV	−	-9.229***	-11.634***	
		(-6.02)	(-4.46)	
Size		1.713***	1.970***	
		(5.47)	(4.04)	
Loss		-2.606***	-1.209	
		(-5.40)	(-0.91)	
CAP_INTEN		-0.459	-3.980***	
		(-0.57)	(-3.00)	
InstOwn		1.351	-0.140	
		(1.18)	(-0.05)	
Industry fixed effect		Yes	Yes	
Year fixed effect		Yes	Yes	
Observations		227	181	
Pseudo-R^2		0.573	0.570	
F-tests:			Diff.	*p*-value
post-2008 reported ratios = pre-2008 reported ratios:				
	InterestCoverage		0.014	0.40
	Lev_MV		-2.405	0.32
	Size		0.257	0.60
	Loss		1.397	0.29
	CAP_INTEN		**-3.521**	**0.01**
	InstOwn		-1.491	0.60

This table reports the robustness tests and sensitivity analyses of firms' decision to repurchase and the determinants of credit ratings prior to and after the adoption of APB 14-1. Panel A reports results of repurchase tests while controlling for firms' past investment efficiency. Panel B reports results of credit rating tests within straight debt issuers. Industry and year fixed effects are included for each model but not tabulated. I estimate the model cross-sectionally. Coefficient *t*-statistics are in parentheses. ∗∗∗, ∗∗, and ∗ denote significance at the 1%, 5%, and 10% (one-sided for variables with prediction, two-sided for others) levels, respectively. Standard errors are clustered by firm. Variables are defined in the appendix D.